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CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

COVER STORY

Going With The Workflow

ALSO INSIDE:

Twice-Told Tales: An Update on Three Strategic Systems

AN INTERNATIONAL DATA GROUP PUBLICATION

The Boston Co.'s Wynelle Hurley

MASS MUTUAL GAINS 40% IN PRODUCTIVITY, THANKS TO DIGITAL.

Despite the recent economic trend, Mass Mutual has shown healthy growth over the past few years. But, as Executive Vice President John Pajak points out, the growth isn't entirely the result of the products offered by the giant insurance carrier.

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Cover photo by George Simian

COVER STORY

Paths of Least Resistance 36

Until recently, workflow redesign—the untangling and streamlining of outmoded work processes—has typically been tied to image-processing or workgroup-computing efforts. But its significant rewards suggest it is a worthy end in itself.

By Richard Pastore

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Over the years, *CIO* has reported on information systems intended to provide companies with strategic advantage. Here we revisit a few of these systems to see how they have fared over time.

By Megan Santosus

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Vendors whose products support distributed applications will move heaven and earth to lure and retain programmers with client/server skills. And when they can't find them, they build their own.

By Mickey Williamson

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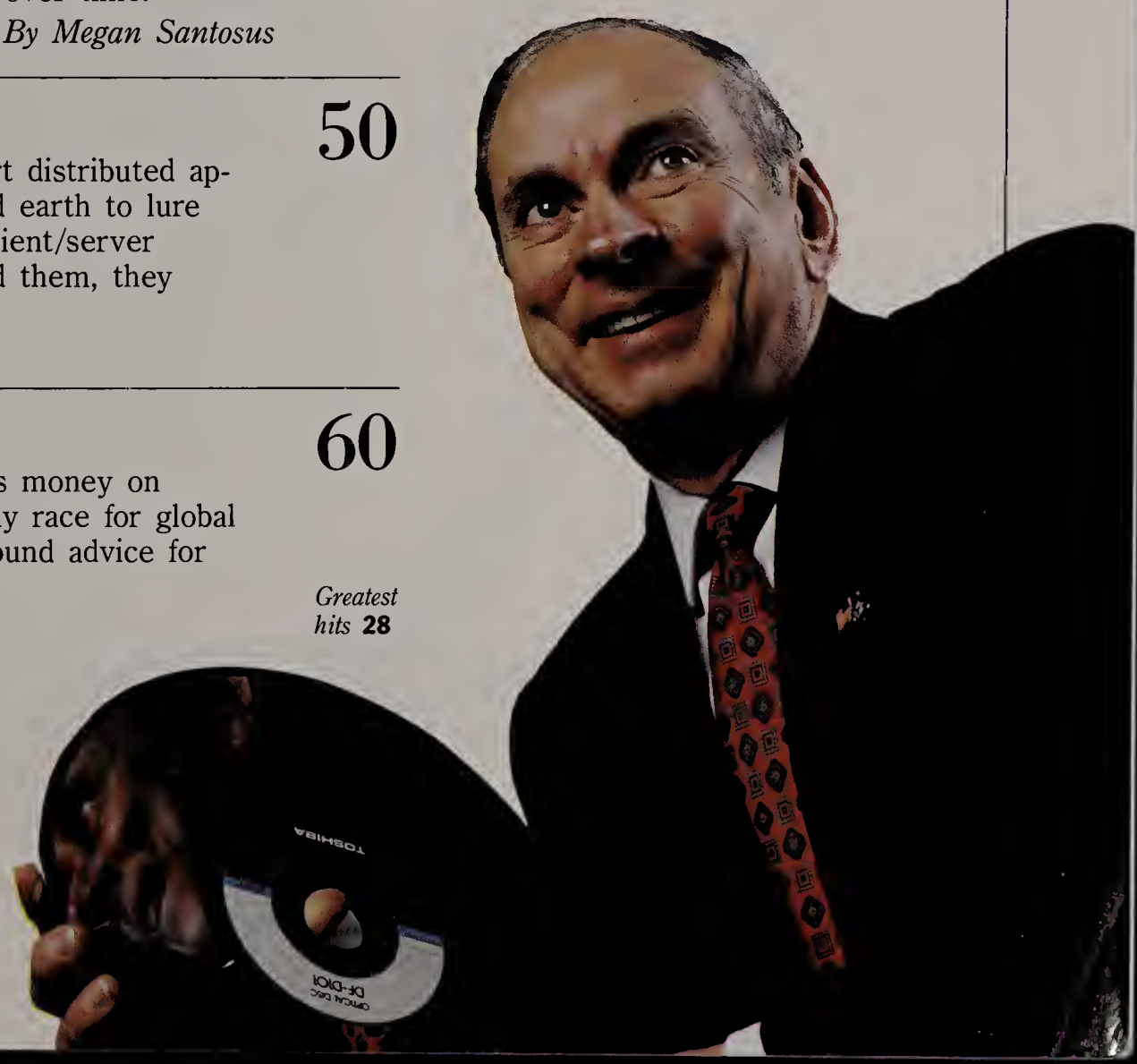
Lester Thurow wouldn't put his money on America to win in the three-way race for global markets. But he offers some sound advice for improving our odds.

By Thomas Kiely



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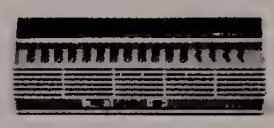

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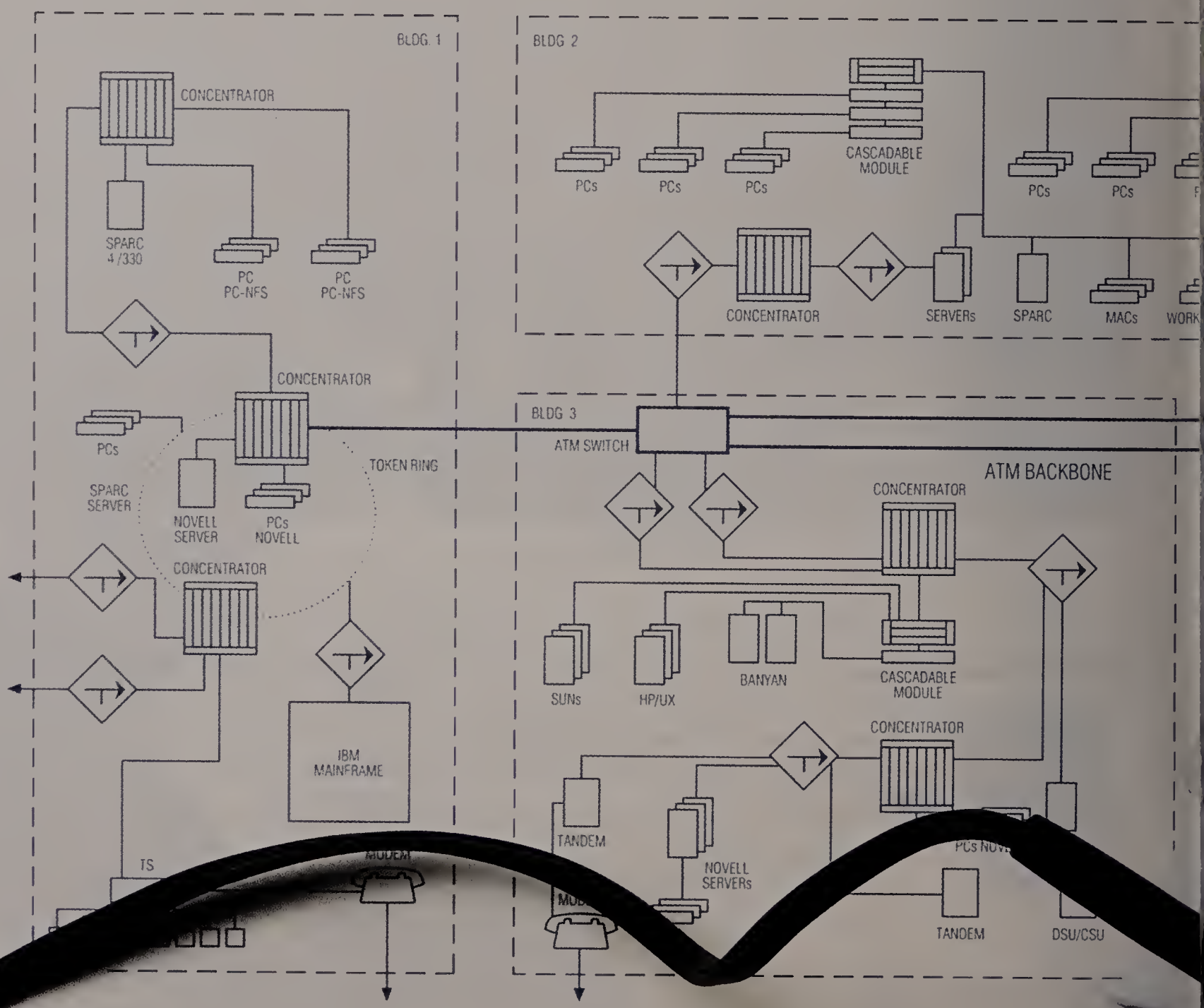

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The Network Fabric of Computing

CIO

ESPRIT℠ Award guidelines and entry form follow page 30

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Virtual Tripp offers an electronic shoulder to the tired, the poor, the fired and the homicidal.
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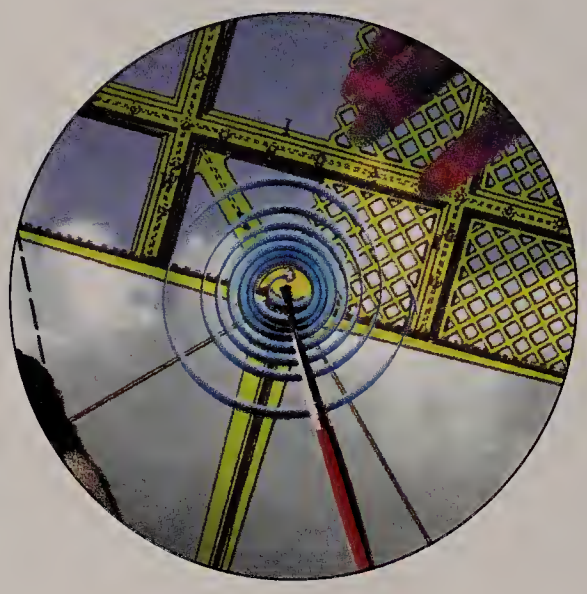

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Here's a complete list of companies that can offer you all three fast packet services.

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2.
3.
4.
5.

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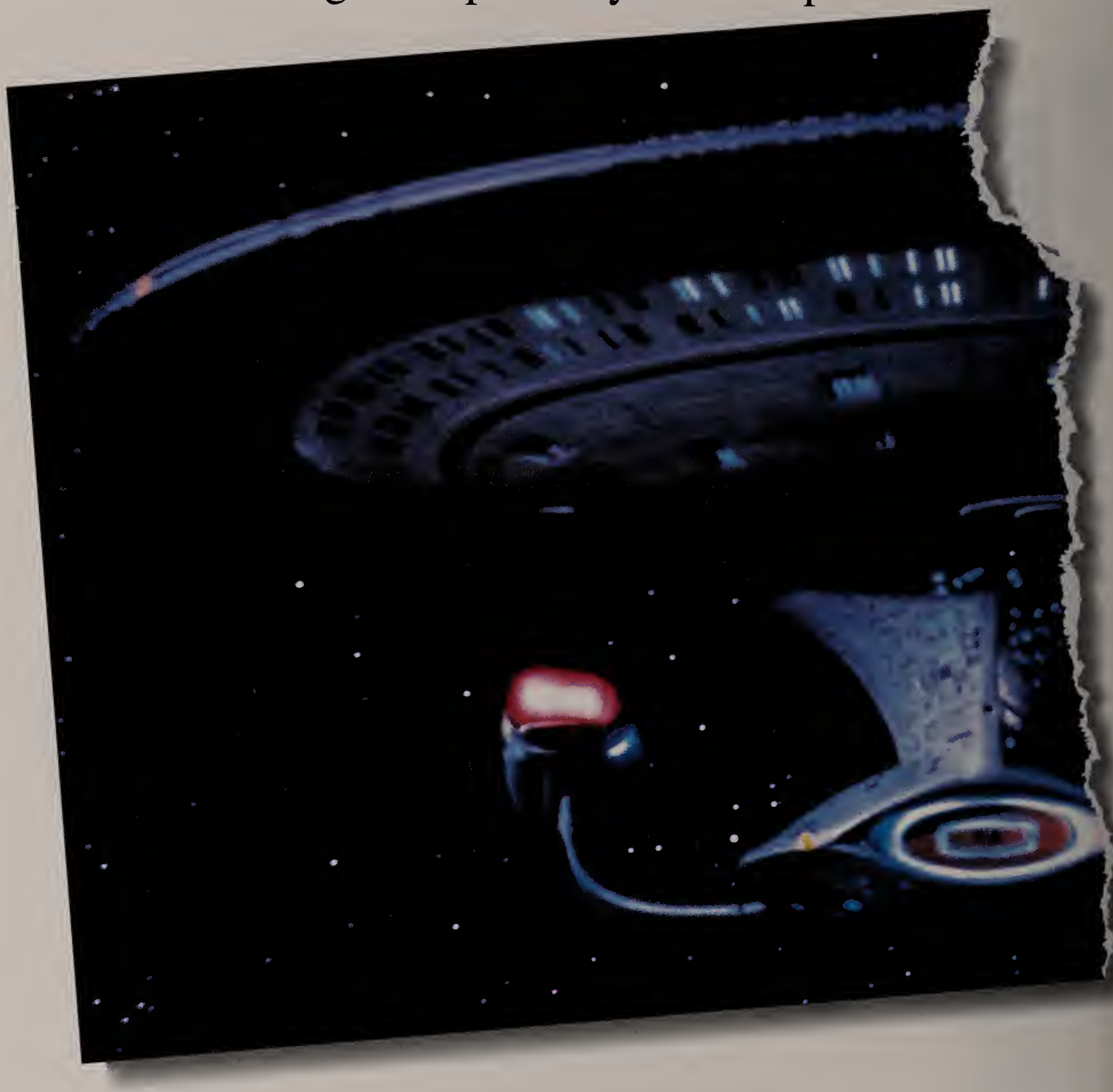

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Making business sense of information technology's impact on organizations is a primary editorial thrust of *CIO* magazine. Over the years, we have come to realize that once the presence of a particular technology is established within an enterprise, its potential and use can expand and change dramatically.

Two of our articles this month explore IT from this perspective. In reporting his article "Paths of Least Resistance," starting on Page 36, Senior Writer Richard Pastore found that image processing has come a long way since its "gee-whiz" days of two or three years ago. Today, workflow redesign is becoming the primary task at many companies, with image processing serving as the enabler of the change rather than the primary focus. "Like an overhead transparency, the technology should be laid over the revised workflow model to show how well its capabilities match and support the changes being considered," writes Pastore.

Likewise, many of the strategic systems we've reported in the past have taken on new lives and deepened their shades since they were first installed. Writer Megan Santosus revisited several of these systems. In "Where Are They Now?," beginning on Page 28, she takes another look at Hyatt Hotels' central reservation system. Gordon Kerr, Hyatt's senior vice president of MIS, reports that a new release of the CRS changes 30 percent of the original system installed in 1990. Recent conversations with Kerr indicate that the company has rethought what check-in means to the customer and significantly reworked the process—and that this has been reflected in the CRS.

The successful use of IT is what makes our readers tick, but occasionally we have a tragic story of CIO failure. Dejected yet intrepid, former CIO Tripp Strange miraculously reappears each April 1 to astound us with his latest adventures. He now presides over a bulletin-board network for failed CIOs. Read about Tripp and No-Net on Page 24.

Marcia Blumenthal

P.S. Entries for our ESPRIT Awards competition are open until May 15. Look for complete information and an application form in this issue after Page 30. Good luck!

PHOTO BY WEBB CHAPPELL

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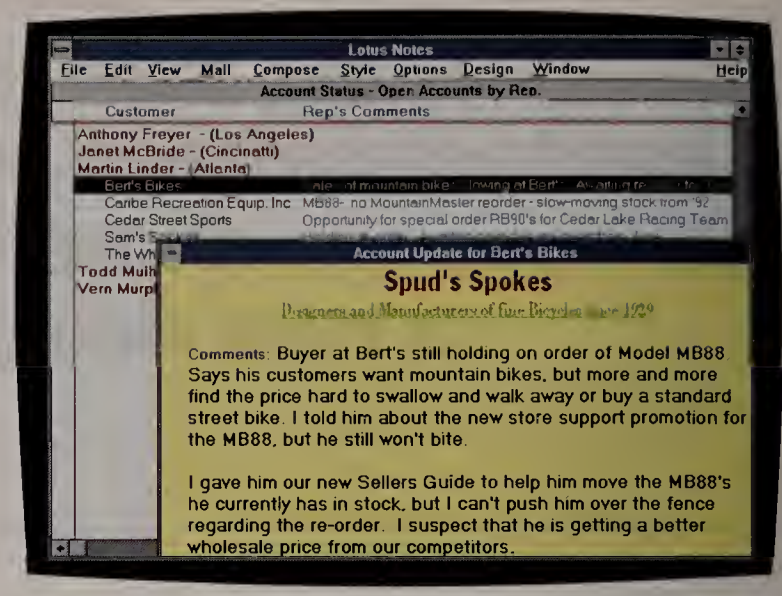
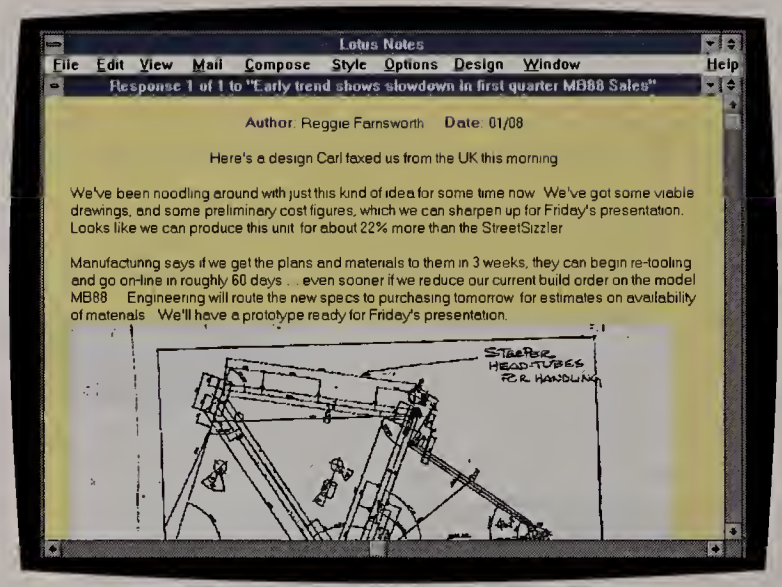
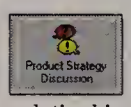
1. This is Michelle's Notes desktop. Each icon represents a different Notes application. She uses these to work with people all over the world including the field sales team, manufacturing, engineering, R&D, key customers and senior management. She regularly scans activities in the field by double clicking on ACCOUNT STATUS.



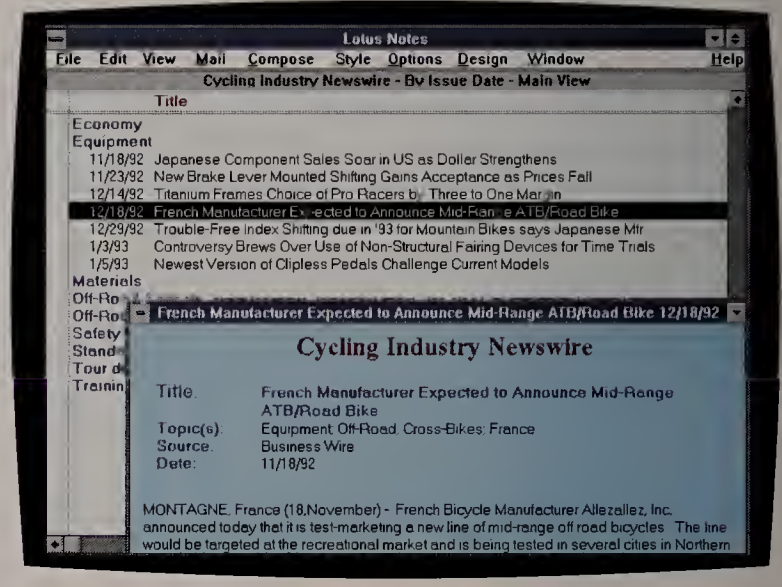
2.

Today, she notices a number of entries regarding a slow-down in closing first quarter reorders for their most popular model, the MountainMaster off-road bike. It seems the market for this high-priced bike is beginning to dry up. This could be a major problem.



5. 

The next morning she checks into the DISCUSSION database and this time finds an entry from Reggie in R&D. Reggie had also read Jim's message and is responding with a possible solution his people have been playing with. He pastes in an autocad illustration faxed to him from the U.K. using a Notes incoming fax gateway.



6.

With a presentation on Friday, Michelle gets down to some quick market research by opening up the CYCLING INDUSTRY NEWS database. An organized source of live industry data, it provides a news report on a French company that has a couple months head start developing a hybrid bike.

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Michelle Cliffington is a product manager for a bicycle manufacturer. She's responsible for all product planning, market research and marketing activities for her product line. Notes helps her shift gears and rush a new product to market.

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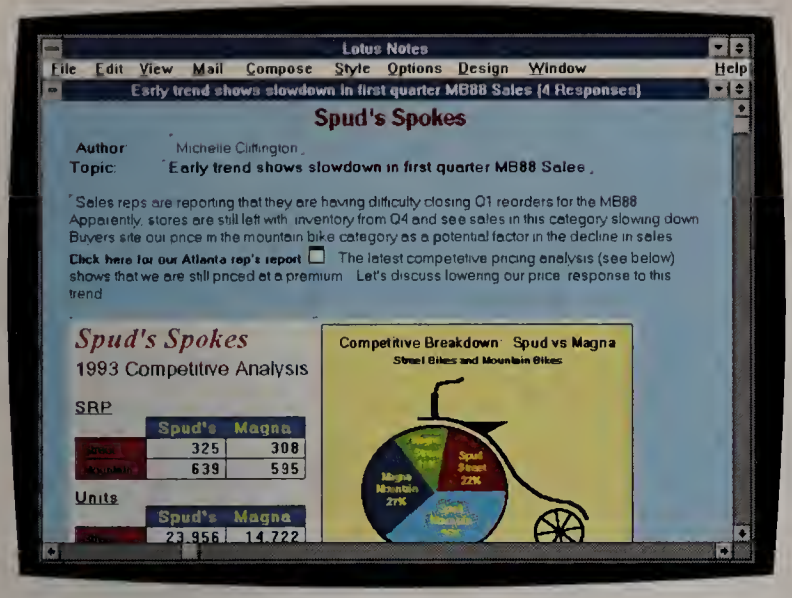
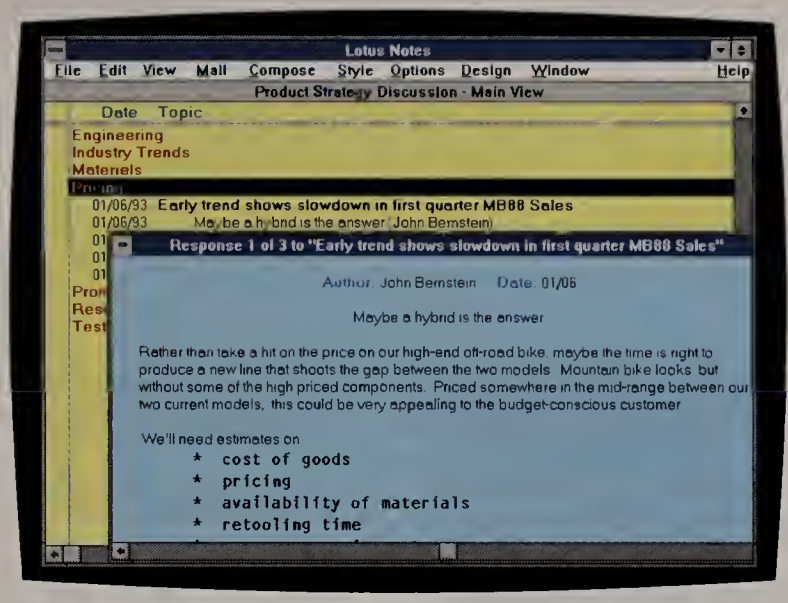


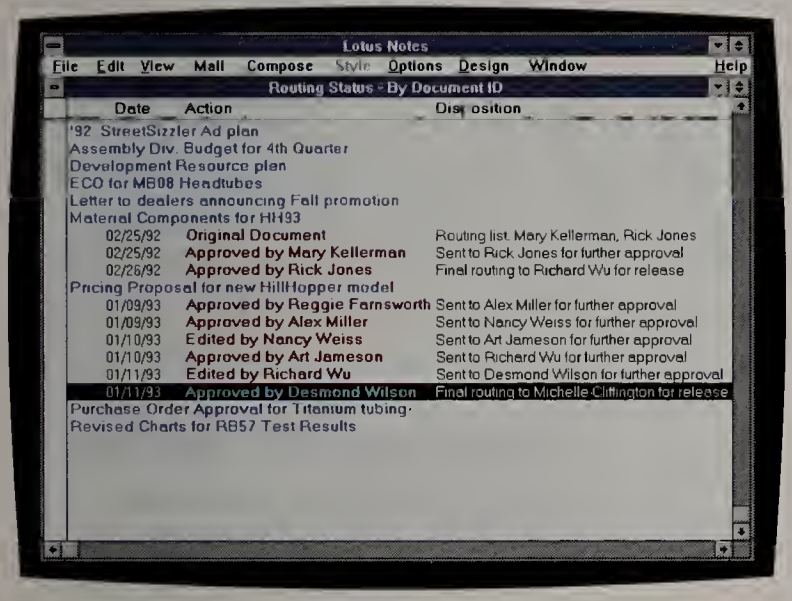
3. Product Strategy Discussion

She decides to recommend a price-reduction and double clicks into the STRATEGIC PRODUCT DISCUSSION database. This provides an organization-wide forum to discuss issues and brainstorm solutions. She links the report from the Atlanta rep directly into her Notes document. Then she uses DDE to embed some 1-2-3® charts into her document as well.



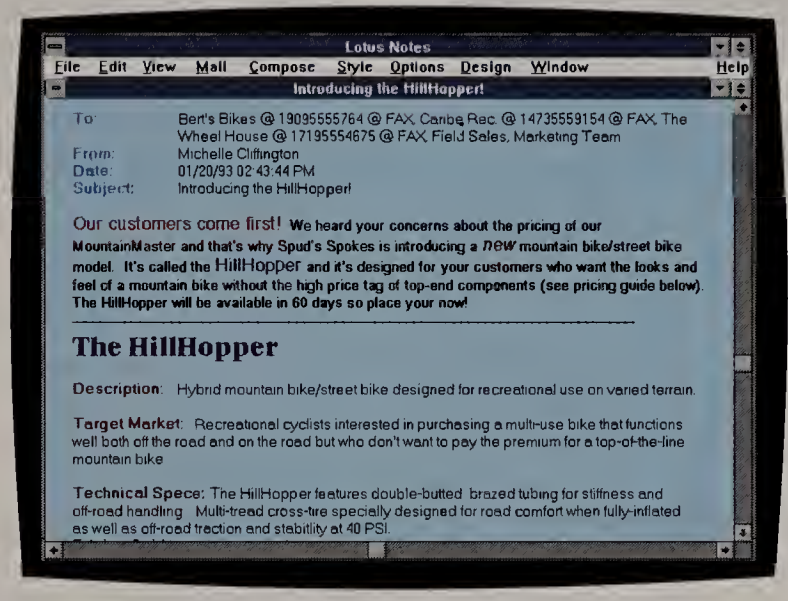
4. Product Strategy Discussion

Later in the day she re-enters the DISCUSSION database looking for responses. Her boss, John, has logged on from his hotel room in San Francisco. Rather than cut the margin, he suggests she explore the feasibility of adding a mid-priced bike to their line. He wants an initial presentation for Friday.



7. Routing Status

A few days after routing her proposal to the product team, she wants to find out where it stands within the organization. She opens the ROUTING STATUS application to find that it has worked its way through the organization to Desmond, the senior decision-maker, and has been finally approved. So she's on her way.



8. Customer Feedback

Michelle closes the loop by communicating the news to their customers. Double clicking into the CUSTOMER FEEDBACK database, she faxes a memo directly from Notes to all retailers. In it she explains that the company has heard their problems and responded with the Hill Hopper. And with delivery in 60 days, they can order now.

can respond with
h Michelle shift gears.

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"Nobody can show that technology pays off on bottom-line productivity."
—Lester Thurow
Dean of the Sloan School of Management
Massachusetts Institute of Technology

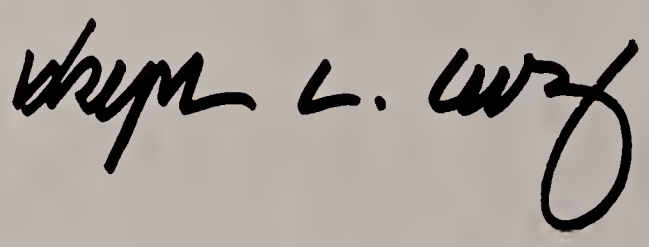
Professor Thurow, renowned management thinker, educator and author, clearly is not convinced that a link between technology and bottom-line productivity can be established. Further, he believes it takes 30 years to realize a payoff from any new technology (see Senior Writer Tom Kiely's interview, "Head to Head," which begins on Page 60).

While we certainly have a great deal of respect for Professor Thurow, we want to disprove his theories on technology payoff. And we challenge our readers to help us do so by participating in our ESPRIT awards program, honoring Excellence in Strategic Partnering for Return from Information Technology.

The goals of this program are to honor those organizations that can best demonstrate the bottom-line business benefits of IT, and to share their ROI measurement methods with all *CIO* constituents in the January 1994 issue of the magazine.

We're happy to report that many of you have already submitted ESPRIT entries. And we're looking forward to hearing from more of you by our deadline on May 15, 1993.

Let's work together to share your ROI successes with Professor Thurow and the industry at large! For more details, see the official ESPRIT entry form included with this issue of *CIO* or call Special Projects Editor Allan Alter at 508 935-4729.



P.S. With your input, we've formulated a comprehensive agenda for the next CIO Perspectives Conference, "The Politics of IT: Reordering the Enterprise," to be held Oct. 17-20 at the Westin Mission Hills, Rancho Mirage, Calif. For more information, please call our toll-free registration hot line at 800 366-0246.

PHOTO BY GEORGE SIMIAN

Coming In CIO

The Quality Quest

The vision of Total Quality requires radical change in the way companies are organized—and in the way IS supports the business. CIOs have always professed to serve customers, but a quality perspective forces them to walk the talk. And while it is too early to judge whether the quality movement constitutes a revolution, an evolution or just a passing fancy, proponents argue that their programs are necessary for future competitiveness and in some instances already show bottom-line results.

Surviving the Boom

Small mutual-fund marketer Janus Capital Corp. faced the challenge of maintaining quality customer-service levels in the face of unexpected runaway growth. The IS department, little more than a one-man, part-time position shortly before the boom, helped Janus pull through—proving its worth and becoming an integral member of the corporate team.

Serving a Core Constituency

Following the infamous events of March 28, 1979, Three Mile Island's Unit 1 reactor was shut down for six-and-a-half years, and the company was approaching bankruptcy. Today TMI has rebounded, achieving financial solidity and safety levels that are among the best in the industry. A major agent of this comeback has been information technology.

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A Uniform Dress Code

Cadet Uniform Services of Toronto, Canada, is doing for the industrial-uniform rental business what Federal Express does for packages. The company has built a database of its uniforms and developed an innovative way to track them electronically as they are delivered, returned, cleaned, repaired and replaced. As a result, Cadet has improved customer service and reduced its costs below those of its competitors, according to Cadet's president, Quentin Wahl.

According to Wahl, Cadet

is the first company to heat-seal bar codes onto clothing, a process that the company is patenting. The codes can be read for the life of the garment without making it uncomfortable for the wearer. As a result, Wahl said, "We know where every garment is in the production and delivery cycle, how many times it has come in to be cleaned, and which wearers haven't sent back enough garments recently."

The technology has enabled Cadet to eliminate the biggest bugaboo in the industry—delivering too few uniforms to customers. "We scan in different places in the laundering and repair cycle," explained Wahl. "If a garment is missing at the end of the cycle, we know the item, its size and the name of the worker who wears it, and we send a new one. We haven't been short on a delivery in over a year."

Bar-code scanning has also enabled Cadet to automate the dull, labor-intensive task of sorting and hanging the millions of uniforms it rents annually. "Our production costs are 12 to 15 percent lower than anyone else's, directly due to the technology."

The sorting process isn't 100 percent automated. The garments have to be positioned on the conveyor belt so the scanners can read the codes, and even then the codes aren't always picked up. So Wahl is now experimenting with inserting radio-frequency chips—dime-sized broadcasting devices that can be read more accurately and easily than bar codes—into the uniforms. If manufacturers can reduce the cost and size of these devices still further, he hopes to automate the process completely.

212 555-CHOW

Give a person a fish and he eats for a day; give a person a telephone and he can find out who's serving the fish and what time they open, or maybe opt for a nice steak instead. That's the idea behind Foodphone, an interactive phone service that allows hungry New Yorkers to get information on menus, prices and locations for thousands of restaurants around the city.

Callers to Foodphone (212 777-FOOD) can request restaurants by name or choose from lists of over 40 different types of cuisine. They can also select establishments based on the locations to which they deliver. Restaurants, which pay $30 a month to be included in the service, make their own 30-second

recordings. For an additional fee, they get a 10-second advertisement that runs at the beginning of a call.

Callers can press 1 at any time during a recording to be transferred automatically to the restaurant to order or make reservations. The Foodphone founders, whose idea for the service sprang from their own frustration over choosing restaurants, plan to set up similar services on Long Island and in Boston, Atlanta, Miami, Pittsburgh, Chicago, Dallas, Los Angeles and San Francisco by next fall. A nationwide 800 number will allow callers to get listings for other cities as well.

All the Right Moves

Under fire to increase quality while reducing costs, data-center managers should pursue the following strategies, according to Nolan, Norton & Co.'s 1992 update of its study "Data Center Metrics and Trends":

- **FORMULATE a clearly defined and well-articulated IT strategy that is linked to the organization's business strategy.**
- **DEMONSTRATE technology leadership to the business by taking advantage of technology advances, embracing client/server architectures and counseling the business on the use of information technology.**
- **UPDATE the applications portfolio, and design applications for operability and lights-out processing.**
- **DRIVE toward higher utilization rates of technology assets such as processors, disks and systems software.**
- **CONTROL technology costs by standardizing platforms, maximizing economies of scale and acquiring technology at the appropriate point on the price/performance curve.**
- **MAINTAIN relatively low staffing levels, with a staff mix favoring knowledge workers rather than those supporting manual activities.**
- **IMPLEMENT effective management controls and procedures.**

The ongoing study involves hundreds of data centers worldwide. To receive a copy of the report, call Joan Elder at 617 723-8800.

ILLUSTRATION LEFT BY JAMES KACZMAN; ILLUSTRATION RIGHT BY MARY ANNE LLOYD

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> President,
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TRENDLINES

SCIENCE EDUCATION

Reach Out and Teach Someone

Pity the poor science teacher. While everyone bewails the state of math and science education in America's schools, these educators remain underpaid, unsupported and frequently unappreciated. But LabNet, a finalist for last year's Developing the Human Side of Technology Award, sponsored by Ouellette & Associates Inc., is trying to change some of that.

A project of the nonprofit Technical Education Research Centers, based in Cambridge, Mass., LabNet is dedicated to reinvigorating science education by creating a community of teachers who can share ideas, resources and classroom activities electronically. Nearly 600 high-school science teachers from around the country participated in the first phase of the project; the second phase, which began last August, reaches 1,500 teachers at all levels of primary education. Both phases were funded by The National Science Foundation.

LabNet promotes "project-based" learning—a technique for involving students in the practice as well as the theory of science. "For a lot of students, science is not something they do; it's something they read about," said Project Director William Spitzer. "We're trying to balance the model of teachers and textbooks imparting knowledge to students with the model of giving students a taste of what it is like to discover, to investigate and to create knowledge out of data they collect."

Using a dedicated telecommunications network that provides access to E-mail and a bulletin board, teachers connect geographically dispersed students and involve them in competitive and collaborative projects. In one, "groups were trying to make a paper structure that would slow the descent of a ball from a meter height to the floor," said Spitzer. Sometimes schools share data collected in different locations "to try to determine something, like the circumference of the earth."

Teachers also use LabNet (offered on the commercial Delphi network during the first phase and on America On-Line during the second) for shoptalk—discussing teaching strategies and sharing resources. "A lot of teachers feel isolated from their colleagues," Spitzer explained. "We're creating a community of teachers who care about their profession and want to try innovative things."

Spitzer said one of LabNet's most important accomplishments was bringing together the traditionally separate areas of professional development (frequently relegated to the summer months) and classroom practice.

"LabNet integrates professional development into the fabric of teachers' everyday work," he explained. "When they get an idea, they can immediately implement it in the classroom, and we hear about it the next day."

Boxing Champions

Kent C. "Oz" Nelson, chairman and CEO of United Parcel Service, has received the 1993 Excellence in Technology Award from the Gartner Group and the Conference Board. The award, now in its eighth year, recognizes leadership in the management and deployment of IT.

While serving as senior vice president at UPS, Nelson created a task force to develop an IT strategy that revolutionized the company's computer intelligence resources, according to the award-selection committee. UPS's multibillion dollar effort to upgrade its systems included handheld computers that capture signatures electronically, a tracking system that monitors packages at various points in the delivery process, and a system that helps dispatchers to determine which driver is in the best position to make a pickup and then to communicate all pertinent information via digital radio.

"Almost overnight, UPS built a world-class information system for international package deliveries," said Manny Fernandez, president and CEO of Gartner Group. "Nelson played a key role in turning the situation around, transforming an operations-oriented company into a master of modern technology."

Diagnosing Abuse

The endless, acrimonious discussion of health care these days is enough to make anyone—well—sick of the subject. But one thing practically everyone can agree on: Physicians who overcharge for their services should be public enemy number one on Hillary Rodham Clinton's Most Wanted list.

A new software product from Health Payment Review (HPR) Inc. of Boston is designed to help insurers control costs by detecting such abuses by providers of ambulatory services—health care delivered outside of a hospital. The product, called Patterns of Treatment, embodies the expertise of hundreds of physicians, surgeons and subspecialists to provide a kind of medical peer review for insurers.

Using data from individual patient claims, the product identifies cases of inappropriate or excessive use of patient services. For example, the system will recommend that a claim be adjusted if a physician consistently bills for a new-patient visit each time the patient goes to the physician's office for a diabetes checkup. Each claim is evaluated using guidelines that are set by a medical advisory board and constantly updated by physician panels.

With health-care costs in this country now totaling about $838 billion annually, HPR hopes that its new tool will prevent providers of ambulatory services from walking away with excessive profits.

ILLUSTRATION BY FRAN O'NEILL

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TRENDLINES

COMPUTER VIRUSES

Still (More Than) a Few Bugs in the System

Computer virus infections are becoming more prevalent in large U.S. companies, according to a survey conducted by Dataquest Inc., a technology market-research firm based in San Jose, Calif. On behalf of the National Computer Security Association, Dataquest interviewed virus troubleshooters at 602 sites harboring no fewer than 300 personal computers. The bottom line: 63 percent of all respondents had encountered a virus on a PC or a diskette during 1991, up from 26 percent in 1990.

Predictably, the more PCs at the site, the higher the likelihood of infection: 84 percent of respondents from sites with over 1,000 PCs reported a viral hit, whereas only 48 percent of those with 100 to 250 PCs reported one.

Viral encounters are one thing, viral disasters another. In Dataquest's terms, a disaster involves the infection of 25 or more PCs or diskettes. Disasters were far fewer than encounters, with only 9 percent of respondents reporting such an occurrence, up from 3 percent in 1990. (Companies with armies of PCs and lots of network connections were the most vulnerable.)

Still, disasters proved expensive. Dataquest calculated that the average cost of a disaster among the respondents was over $6,000—but one company reported suffering $2 million worth of damage. Most companies (86 percent) reported that the disruption took five days to clean up, but some said full recovery took from 60 to 90 days.

Of the respondents who could identify how the virus entered the company, 87 percent cited diskettes, while the other 13 percent traced the attacks to data downloaded from bulletin boards or to PCs that had been shipped with the virus. The most commonly reported effect of a virus attack was loss of productivity (62 percent). Other side effects included corrupted files (38 percent), loss of data (30 percent) and system crashes (23 percent). Disasters, said Dataquest, seem more likely to result in damaged applications than do encounters.

Two viruses were especially prevalent in 1991, accounting for the majority of attacks. Stoned (also called Marijuana or New Zealand) hit computers in 48 percent of the sites that suffered a viral attack; Jerusalem (a.k.a. Israeli or Friday the 13th) hit 37 percent.

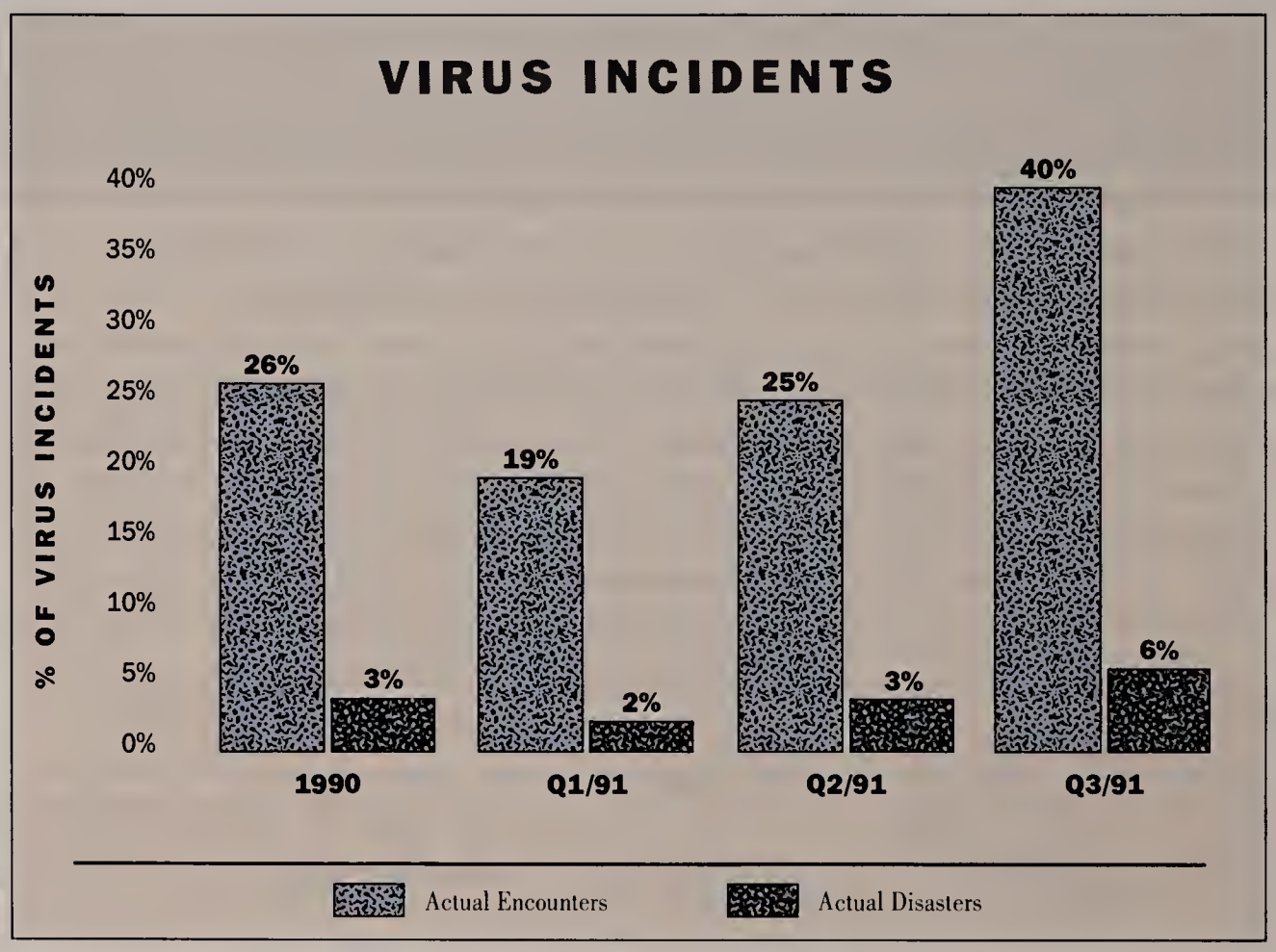

CHART SOURCE: DATAQUEST INC.

On the Record

Whenever a noun strays from the straight and narrow to become a verb without lexicographical sanction (consider the tragic fall from grace of *impact*) a few tears are shed by the purists, but most "regular speakers" celebrate what they perceive to be the enhanced facility of the language. A recent case in point was the subject of William Safire's "On Language" column in *The New York Times Magazine*.

"How does one spell the past tense of the verb *modem*?" inquired Brian Wallace of the Computer Museum in Boston. (Wallace had written in response to Safire's call for a word to describe what the postal carrier delivers in this age of electronic messaging. Safire favors *post* or *hard mail*; Wallace's suggestion was *snail mail*.)

Safire's answer, as usual, is instructive:

"It's nice that they turn to the old ink-stained wretch, with his quill pen poised, for spelling decisions that are not yet in their spell-checking programs. Here's the trick: when adding *-ed* to a verb, double the last letter when the accent is on the last syllable, as in *occur/occurred*; contrariwise, leave the last letter single when the accent is on the first syllable, as in *cancel/canceled*. On that analogy, and presuming *modem* to be pronounced MO-dem, the past tense should be spelled *modemed*.

"Objections to this decree will be entertained, but not if faxed and certainly not if fax-modemed. I prefer *snail mail*."

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TRENDLINES

EVENTS

The Positive Power of Humor & Creativity

Saratoga Springs City Center, Saratoga Springs, N.Y.
April 16-18
The Humor Project Inc.
518 587-8770

The focus is on the serious implications and uses of humor and creativity in business, health care, education, human services and the family. Participants practice methods for tapping their own senses of humor and creative problem-solving abilities. Comedian Steve Allen is the featured guest speaker. Registration fee: $375.

ICA COMNET Dallas '93

Dallas Convention Center, Dallas
May 16-20
International Communications Assoc. and World Expo Corp.
508 545-3976; 800 225-4698

This conference concentrates on applications solutions for the enterprise network. Special events include a showcase built on five technology platforms, a presentation on telecom industry trends, industry keynote speakers and a demonstration of emerging video and wireless technologies. Registration fees: $445-$695.

Home Tech '93

The Javits Convention Center, New York
June 4-7
International Expositions Management Group Ltd.
516 674-0200

Home Tech provides education, information and networking opportunities for home workers and telecommuters. It also offers a range of products and services that facilitate operating out of the home, along with workshops and training sessions. Registration fee: $15 per day.

Successful GUI Migration Strategies

Palmer House, Chicago
June 22-23
Digital Consulting Inc.
508 470-3880

This seminar addresses development, training, support and maintenance issues for GUIs as well as ways to create a GUI-client/server infrastructure to foster development of these new systems. Attendees learn the application-development tool categories, pros and cons of specific tools and how to match tools and applications. Registration fee: $795.

CAREER MOVES

DAVID R. PROCTOR is the new president of Xerox Computer Services, the division of Xerox Corp. that markets manufacturing-planning and -control software. Before his appointment, Proctor served as consultant to several Xerox business units.

JOHN R. GARVIN has been appointed CIO and a member of the executive committee of New York-based GFT USA Corp., a subsidiary of Gruppo GFT, a multinational producer of men's and women's apparel. Most recently the head of an independent consulting practice, Garvin will be responsible for the development of more sophisticated systems to support the management functions of all divisions.

SAFE DEPOSITS? DON'T BANK ON IT

As an ATM card holder, you've probably considered more than a few times how vulnerable you are to attack, standing alone with your wallet in your hands and your back turned to whatever dangers might be creeping up on you. It's a frightening prospect that looms larger as more banking takes place after hours in deserted suburban shopping malls and isolated parking lots.

Banks reap nice profits from these minimum-labor automated alternatives. But their efforts to ensure customer safety have been spotty at best, according to one high-profile ATM mugging victim. David Breen, a Manhattan assistant district attorney who was stabbed at a Brooklyn ATM, filed suit earlier this year against Chemical Bank for security negligence. While some banks post guards at ATMs at upscale city locations, there are virtually no safeguards at suburban sites, Breen argued. There, it's "bank at your own risk."

Bank officials argue that experiences like Breen's are quite rare. They also point out that no security system would do much good for customers assaulted after they leave the booth. Nevertheless, if Breen's suit makes headway, banks may be forced to protect the security of more than just data and dollars.

ILLUSTRATION BY FRAN O'NEILL

NEW VENTURES

The National Technology Transfer Center (NTTC), in Wheeling, W.Va., is making available to U.S. businesses and industries its database of technological information produced by the nation's 700 federal laboratories. Aerospace, computer-aided manufacturing, electronics and energy development are among the subjects. The database can be accessed by calling 800 678-NTTC.

American Airlines Decision Technologies (AADT), of Dallas, has introduced a consulting service that focuses on pricing, sales, distribution and frequent-customer programs. The service is designed to increase the profitability and market share of travel- and transportation-related businesses.

A group of American and British providers of corporate financial information have set up Companyline, an integrated online database of financial reports from more than four million companies in 40 countries. Credit ratings, brokers' analyses, directors' resumes and other important corporate information will be updated on a daily basis by MAID Systems.

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new applications, greater information loads and growing user demands. These same building blocks provide alternate processing sources and data paths that keep the Infinity 90 running continuously throughout your growth. It all boils down to a host computer that can be shaped to your unique enterprise demands while supporting your downcosting and business re-engineering efforts.

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organization. With the Infinity 90, you have a ***total*** *communications solution that permanently lifts productivity throughout your enterprise. And that's what today's global market demands.*

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thing that is less...its footprint. Upgrades are made with minimal impact to productivity and floor space. And because you can step up performance a little at a time or all at once, you can meet any application requirement on demand.

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and a wealth of data base software, languages and development tools. All of which dramatically and permanently lower programming requirements and training costs. In short, the Infinity 90 delivers economic health to your entire enterprise.

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TEXAS INSTRUMENTS

My New Modem Operandi

Virtual Tripp offers an electronic shoulder to the tired, the poor, the fired and the homicidal

BY TRIPP STRANGE

I used to hate technology. I've never before admitted that to anyone. After all, before being ruthlessly outsourced, I was once a CIO (see "O, Lucky Man," *CIO,* April 1989, and "Oops...My Luck Ran Out," *CIO,* April 1991). I was supposed to be a technology hipster, in love with MIPS and DASD and EPROM and CASE tools and brouters and my pocket protector. But no. I thought it was all boring, stupid, pointless—cheese for chumps—except, of course, that it provided me with a decent living and a way and a place to spend my worthless, moronic days. Vendors knocked on my door and took me to lunch and treated me with a transparently butt-kissy insincerity that was much more sincere than I deserved. I was, in short, an appalling cynic. It was a glorious racket.

What a country!

But lately I've come around. I've turned into Virtual Tripp, the electronic weenie! I've retreated into cyberspace. Technology *can* transform a normal, jaded human such as myself into a supernatural being! I am everything and nothing. I am swamp gas, steam, a shadow. I seem hardly to exist anymore in the usual ways. Instead I've become the quality of mercy, of compassion, of forgiveness. I'm a ghostly stream of bits pulsing coolly on supertwist notebook screens in the quiet dens of angry, despairing, denying, grief-struck ex-CIOs. I'm their Miss Lonelyhearts, their priest, their barber, their bartender and their designated driver all rolled into one.

"Tripp, I don't know where else to turn...."

What am I? What do I do? I run a bulletin board, *their* bulletin board. I call it No-Net. I tell them I named it after them, because they fell from grace and learned that there was "no net!" My headquarters here is a trailer park in Lincoln, Neb. Late at night my modems gasp, wink and dance. Here come my users....They have a few drinks after everyone else has gone to bed, then they dial me up and we talk. We have this dialogue.

"Tripp," they say, "thanksalot for beeng there." The grief slinks silently across the screen as many of them slur their words with typos. They express their hurt. They say: "Tripp! We dont matterranymor! We dont have a nice placeto blong!"

And it's true. They don't. They're discards, dregs, the outsourced, the lumpen, the miserable, wretched, dejected, forgotten....

But that's not what I tell *them*. Naturally, I tell them to become consultants, just the same as I did (see "Sympathy for the Consultant," *CIO,* April 1, 1992). That way, like me, they can earn the ability to forgive and forget. Along with a tidy living. They can stop being the victims of smart consultants and start being

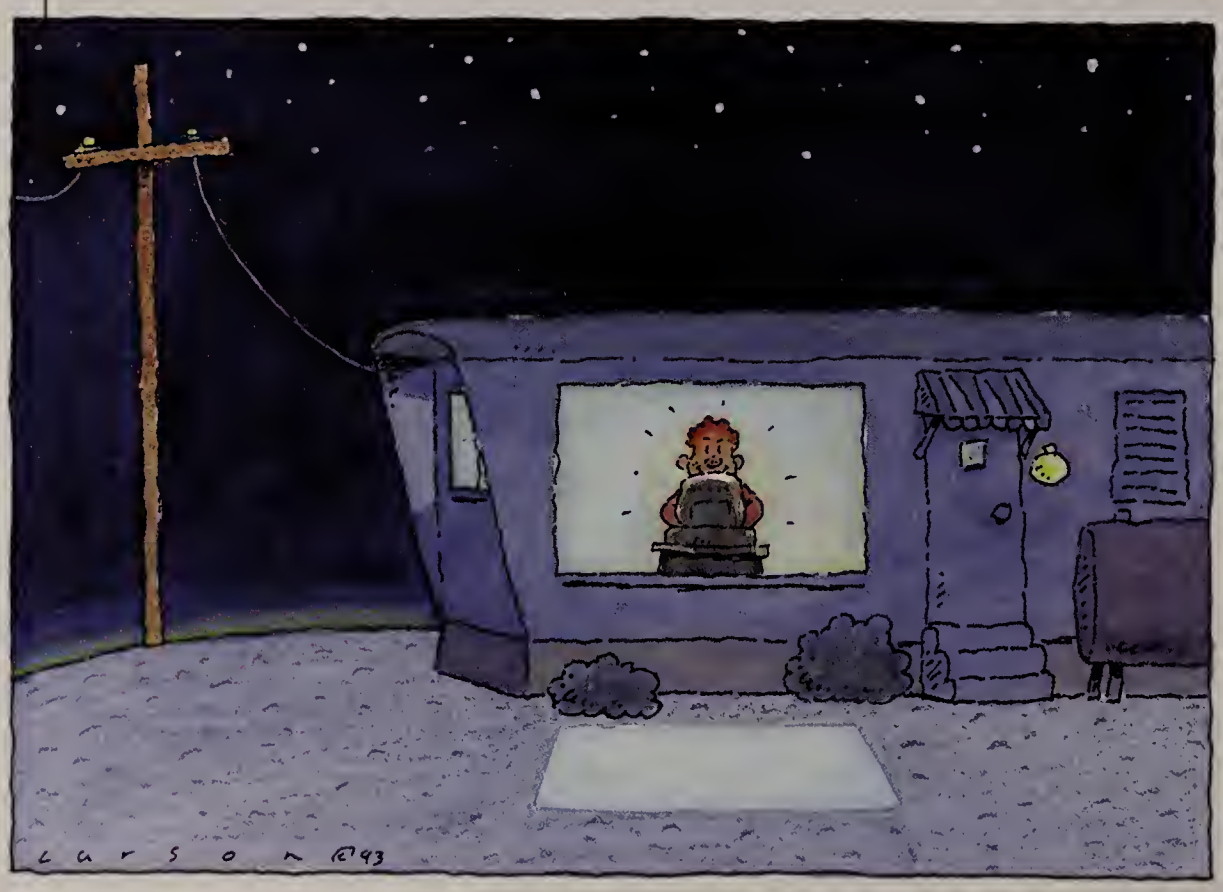

ILLUSTRATION BY JIM CARSON

Impact on productivity shown actual size.

1%. That's the total increase in corporate productivity since 1980. By contrast, investment in information technology over the same period billowed to almost 50% of capital spending.

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those smart consultants themselves.

I mean, which would *you* rather be?

But before I tell them what they need to do, I let them vent a little. There's a cure for everything, and whining really helps.

Take B.J. from Richardson, Texas, a tragic gaslighting victim: "With me, what they did was they basicly tried to make me think I was going craizy."

"Is that right?" I type. (See, there's really nothing to becoming a supreme being. All you do is just seem to be paying attention.)

"Yeah. They'd have all these people replying to memos I never sent. It was very orcastrated. And one time I came back from lunch and my wastebasket was on fire."

"How strange," I type.

"People showed up for meetings I'd never scheduled. People came for job interviews when we had no openings."

"How embarrassing."

"Why didn't somebody just fire me? I mean, wouldn't that be easier?"

"A good question."

Then another caller chimes in. "Elaine from Fort Wayne." She wants to know if anybody can help her make a pipe bomb.

"Not me," I type.

"I can," replies B.J.

Bingo. A little retribution can be a healthy part of the recovery process. Tactfully, I withdraw to leave Elaine and B.J. to discuss plastique technique.

You'd be surprised how many of my virtual pals express these, uh, homicidal impulses. Todd from Tulsa discusses poisons that can be undetectably injected into those premeasured mylar coffee-service pouches.

"You don't really want to KILL anyone," I type. "Do you, Todd?" There's a long, unresponsive silence. But I owe him the opportunity to pretend it's all a big joke, just in case the FBI is out there monitoring my traffic.

"Well, sure I do, Tripp," replies Todd.

Have it your own way, Todd. He's one of my regulars. He used to run EDI at a major pharmaceuticals company. He thought he could spiff up the JIT program by turning away suppliers' deliveries if they failed to arrive in the preordained window of acceptability. Stuff was getting refused left and right before he figured out it was actually arriving at the plant gates on time but not getting logged in by receiving until, oh, about 36 hours later. Oops. Did wonders for supplier relations. "It was a good idea," Todd constantly reiterates.

A little retribution can be a healthy part of the recovery process.

The director of operations came to his office with a security squadron and ushered him unceremoniously to his parking place, where maintenance was already painting over his name. He imagines all of them dying painfully three sips into their java. "I have grounds," he says. "No pun intended."

Then there's Chloe, ex-CIO of a Midwest insurance company. She started an IS quality program called "Customer-Focused Cobol." All the programmer-analysts wore fatigue caps and dressed in powder-blue jumpsuits with lightning-streak epaulets. Whenever the phone rang, they answered, "Action Central! State your problem!" In the early mornings they jogged in formation through the halls, chanting things like:

"I write Cobol code all day
Make the users pay and pay
CHARGEBACK
(chargeback)
CHARGEBACK
(chargeback)
1-2-3-4... GL!"

"It was really fun," Chloe asserts. "Morale was great. We had this neat superhero thing going." IS people would charge into user departments like cops looking for drugs. They demanded fresh problems to solve. The users were intimidated by the uniforms and the aggressive approach.

"I guess they thought it was a little too paramilitary," Chloe now concedes. "I just wanted us to be more proactive."

Chloe and her Cobol rangers left the company en masse, in effect going up into the hills, like Che and Sandino, to become a kind of guerrilla force, hacking for hire into organizations where management scorns innovative approaches to IS service delivery. She drums up quite a bit of business through No-Net.

"I'm making the world a better place," she types, "for people like me and thee."

"Amen," I type back.

I'm a little worried about this FBI stuff, though. I keep hearing rumors of bands of cybercops sleuthing America's bulletin boards in search of traffickers in smut, conspiracy, phone-access codes, bomb recipes and the like. With every new user my suspicions rise: "Is this guy the one?" I think.

I look for the overprecision of coptalk: "Hi, Tripp. My name is Robert. I used to be a chief information officer working in the information services field." Yeah, sure.

But these cops are cleverer than that. They could be anyone. There's a beige sedan that's been hanging around in front of my trailer court. A couple of guys reading the paper. Makes the hair stand up on the back of my neck when I come back from the 7-Eleven with a gallon of Diet Coke. Is this my approaching destiny, to be overzealously prosecuted for running an online criminal enterprise?

My modem burps, hisses.

"Tripp?"

"I'm here," I type.

"I just got fired."

"Poor baby..." I type. "Have you given any thought to consulting?" CIO

None of this is true. Tripp Strange is a fictitious ex-CIO and ex-consultant who runs a bulletin board in Lincoln, Neb.

Open Systems Imaging: What's In It For You?

Cost-Effective Information Management

You've surely heard of the many benefits of imaging technology. But with all the investments in your department's computing environment, it just doesn't make sense to purchase a large, costly imaging platform that locks you into proprietary technologies, or a small, PC-based system that lacks the power to perform the applications you really need.

ERI has the solution.

OutLOOK is an open-architectured imaging system that fits easily into your department's current computing environment – MS-Windows-based PCs, Apple Macintosh computers, X-terminals, Sun Microsystems® workstations and servers, you name it! ERI integrates existing hardware and software with new systems and applications resulting in more efficient, cost-effective information management capabilities on the desktop.

Available in a basic configuration, or with a wide choice of enhanced functions and custom-developed applications, OutLOOK incorporates the latest in scanning systems, optical storage devices, flexible RDBMS software, and powerful computing platforms that are completely open to new technologies and changing user needs.

Real World Benefits

What does OutLOOK mean for our clients? For one multinational bank, it meant an escape from antiquated systems that were limiting their ability to manage numerical and textual information.

ERI Custom Software Services designed an OutLOOK System to streamline the gathering, storage, and manipulation of large volumes of data. By integrating Sun Microsystems® SPARCstations™, leading-edge scanners with character recognition software, a relational database and a customized graphical user interface (GUI), the bank acquired a valuable tool which dramatically reduces costs and improves departmental productivity.

800-222-1050

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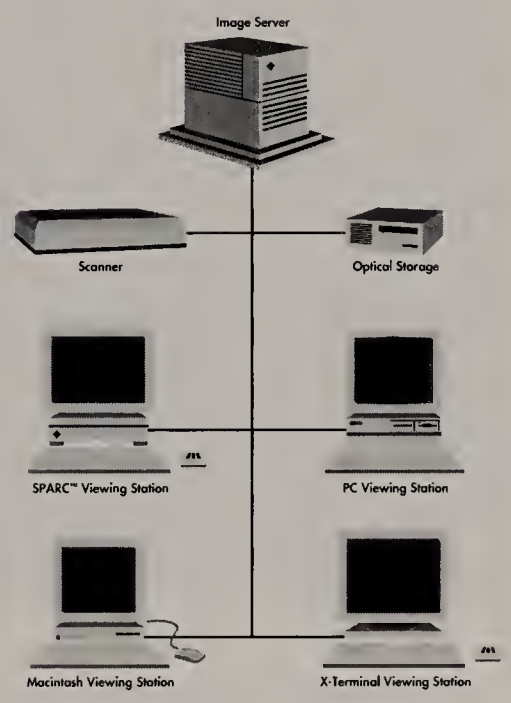
Customized Solutions

Because we custom-develop OutLOOK to match specific requirements, users can retrieve and edit visual data on Sun SPARCstations, PCs, X-terminals and countless other devices. ERI University's Corporate Trainers provide customized training, so users gain the knowledge and confidence they need to use the system effectively. And ERI's Customer Support Center provides tailored service programs that give users the assistance they need, when they need it.

Penalty-Free Upgrades

To protect your investment from product obsolescence, ERI offers the most current technologies as well as leasing programs that permit upgrades without financial penalty. So, you can upgrade your system and protect your bottom line at the same time.



Sample OutLOOK Configuration

Improve Your Outlook

If you want to preview the power of OutLOOK, call us today and we'll send you a free OutLOOK VHS tape or CD-ROM presentation. Just ask for Department D-2.

Sun Microsystems Computer Corporation
Commercial Systems Integrator

WHERE ARE THEY NOW?

BY MEGAN SANTOSUS

Over the years, CIO *has reported on information systems intended to provide companies with strategic advantage. Here we revisit a few of these systems to see how they have fared over time.*

Automated claims processing and mobile technology enabled auto insurer Progressive Corp. to expeditiously process thousands of claims in the wake of Hurricane Andrew last summer—despite the fact that its area service center had virtually been destroyed.

Hyatt Hotels' central reservation system lets customers get up-to-the-minute, accurate and consistent information about rooms and rates, not only from the reservation center but from individual hotels and travel agents as well. And while USAA expected its imaging system to free up thousands of square feet of storage space and over 100 clerical workers for other use, it had not anticipated the significant improvements to its management processes and workflow that resulted.

PROGRESSIVE CORP.

Automated Claims Processing

CIO examined Progressive Corp.'s reverential attitude toward data and information systems in a March 1990 profile. The Cleveland-based auto-insurance company was then in the process of rolling out its largest IS project ever: a $28 million online automated claims-processing system. "The new system is going to have an astounding impact on our business," predicted Bruce Marlow, Progressive's executive vice president and chief operating officer. In addition to improving customer service by enabling the organization to handle claims 24 hours a day, Marlow hoped the system would lead to significant cost savings by trimming the time required to settle claims.

If Bruce Marlow ever decides to give up being a COO, he might try being a soothsayer. He was right on target about the impact that the Progressive Automated Claims Management (PACMan) system would have on his company's business. "The system today is very important to us strategically," he said. "It lets us respond rapidly in different situa-

ALLAN DITCHFIELD *(driver's seat) and* **BRUCE MARLOW:** *Progressive's success is no accident.*

PHOTO BY JACK VAN ANTWERP

tions"—such as in the aftermath of Hurricane Andrew last summer. But what Marlow didn't foresee was the effect PACMan would have on Progressive's internal processes and the role IS would have in subsequent planning efforts as a result.

Under the company's previous approach to processing claims, handwritten documents, hard-copy files and forms proliferated. With PACMan, claims processing has become fully electronic, according to Marlow. Representatives now enter real-time information directly into the system, which also gives them immediate access to customer files.

"We can start processing a claim almost as soon as an accident happens," said Marlow. Customers can file loss reports night or day by calling an 800-number. Calls are directed transparently to the closest local office or the 24-hour reporting office in Cleveland, where the information is entered into the PACMan system. An adjuster verifies coverage and electronically transfers all applicable files to a central office, where the report is processed.

If an adjuster needs to visit the accident site, he or she arrives on the scene armed with all the relevant data. The adjuster uses a laptop computer to write a draft damage report; reports can be filed remotely, 24 hours a day, with the use of cellular technology. Typically, claims are settled within two days of an accident; the record is two hours. Under the old system, the best time was five days.

Settling claims quickly not only makes customers happy; it also has a direct impact on the bottom line.

The average check issued by an adjuster is for about $5,000. Delays in processing can cause increases (for using a rental car, storing a damaged car, etc.) of as much as $2,000. The more quickly claims are settled, the lower these charges will be.

PACMan was put to the test in a big way this past summer when Hurricane Andrew virtually destroyed Progressive's service center in Kendall, Fla. A day after the storm, Progressive reps set up office in vehicles with cellular phones or near working pay phones and started adjusting claims. The next day, the company converted its garage in Kendall into a fully functioning claims office equipped with cellular phones and laptops with modems. With remote access to PACMan, coverage could be verified as soon as a customer came in with a claim. "There were no telephones, no street signs and sometimes no policy numbers, yet PACMan worked fine," said Senior Vice President of IS Allan Ditchfield.

According to Progressive, 95 percent of the more than 2,500 hurricane-related claims were paid within one month of the hurricane, with 72 percent settled on the same day vehicles were assessed. Little wonder, perhaps, that Progressive had record-breaking sales in the Kendall area in the month following the hurricane.

The rollout of the system taught Progressive a lot about the importance of redesigning workflow and using IS-business teams to do it. The original system defined too many data elements, and these required elaborate coding, Marlow explained. Having over 600 screens full of information when probably 10 would have been sufficient pushed up transaction costs significantly. Marlow and the IS team learned the importance of simplifying workflow by identifying key screens and data elements. "In planning the next big project," Ditchfield said, "we now know to assemble a business team with IS people on it." ■

GORDON KERR
has no reservations about the system's benefits.

HYATT HOTELS CORP.

Centralized Reservations

Three years ago, Gordon Kerr, then vice president of MIS at Hyatt Hotels Corp., and his staff set out to revamp the Chicago-based company's limited and maintenance-hungry central reservation system (CRS). Their objective was to transform the system into an advanced tool to help Hyatt provide efficient, accurate and personalized customer service. When *CIO* profiled Hyatt in October 1990, the company had just implemented a CRS that enabled individual hotels to send room-availability information electronically to the reservation center in Omaha, Neb. Over the following six months, Kerr planned to add five features to the system that would "make it a cohesive, companywide CRS."

A lot has been going on at Hyatt during the past couple of years. Since 1990, IS has been constantly revamping and enhancing the CRS. "We wanted to speed up the applications-development process by a major factor," explained Gordon Kerr, now Hyatt's senior vice president of MIS. "We used to have a major release of software once every six months,

PHOTO BY JACK VAN ANTWERP

The ESPRIT℠ Awards FOR 1993

Honoring Excellence in Strategic Partnering for Return from Information Technology

Sponsored by *CIO* Magazine and Booz·Allen & Hamilton

"Wow. We n
technology could
contribution to

The value of IT. It's real. You know it and you've proven it. Your organization is actually realizing business value and hard-dollar benefits from information technology investments. And although the payback is its own reward, a little recognition will bring your company and IT organization the industry recognition you all deserve!

ESPRIT℠ Awards Timeline

Applications Due:
May 15, 1993

Judges Select Winners:
September 1993

Announcement of Winners:
January 1994

Awards Ceremony:
Spring 1994

Honor and Recognition

It takes a disciplined organization to strategically plan the acquisition of information technology, implement it and reap the rewards. It takes more than guts and business savvy to ensure that technology solutions succeed. It takes partnership.

CIO and Booz·Allen & Hamilton have created the ESPRIT℠ Award to honor those organizations using IT to its fullest potential — companies that strive to use IT to provide real business value.

Positioning IT as a Business Asset

Many companies still regard information technology as an overhead expense, not as a valued asset. It's time we turn these misconceptions around and inform organizations that IT actually can lower costs, increase profits or enhance your market image.

ever thought make that kind of the bottom line."

In essence, the ESPRIT℠ Award goes beyond recognition. It is an opportunity to provide hard, tangible facts about return on investment from information technology to the business community at large. It is an opportunity to demonstrate how partnering between business and technology executives can increase the effectiveness of both and accelerate the achievement of strategic objectives. By communicating the payback, *CIO* and Booz·Allen & Hamilton hope to encourage other businesses to invest in IT to ensure their survival in a fiercely competitive global market. The award recognizes those who have successfully provided value with IT, while providing *CIO* readers with the ammunition to both justify spending on information technology and measure IT's ROI.

Our Challenge to You

If your technology investment is paying off in this way, we want to hear about it....

We urge you to participate by filling out the ESPRIT℠ Awards application form. The January 1994 issue of *CIO* will feature the companies, government agencies and not-for-profit organizations that have proven that partnered IT investments can have a positive and sustained impact on the bottom line. Then in early 1994, *CIO* and Booz·Allen & Hamilton will host a special awards ceremony honoring these winning organizations.

For more information, contact Mina Ahn at (508) 935-4449.

The 1993 ESPRIT℠ Awards

For Excellence in Strategic Partnering for Return from Information Technology

Sponsored by *CIO* Magazine and Booz·Allen & Hamilton

STATEMENT OF PURPOSE

Executives are aware of the potential benefits of information technology (IT) but remain unsure of its actual value to their organizations. In order to demonstrate how IT can produce hard-dollar benefits when aligned with business needs, *CIO* Magazine and Booz·Allen & Hamilton are co-sponsoring the ESPRIT℠ Awards. The honorees will be public and private companies, government agencies and not-for-profit organizations which have proven that IT investments can have a positive and sustained impact on the bottom line. Winners will be honored at an awards ceremony and profiled in the January 1994 issue of *CIO* Magazine.

CIO will also use the information collected from entrants to provide readers with insights into how to calculate the return on investment from information technology.

We invite information-systems (IS) and business-unit executives to jointly apply for the award, provided that:

- they can demonstrate, in actual dollars, the return on investment achieved from the application of IT, and
- they are willing to be featured, along with their system and organization, in a *CIO* article.

DEADLINE
May 15, 1993

MAIL TO
ESPRIT℠ Awards
CIO Magazine
492 Old Connecticut Path
PO Box 9208
Framingham, MA
01701-9208

CRITERIA

Winners will be chosen by a panel of independent judges from entrants who have sent in completed nomination forms by May 15, 1993. Entries will be judged on the following criteria:

- The measurable financial return to the organization.
- The extent to which that return is aligned with the organization's strategic objectives.
- The extent to which IT was key to the achievement of the return—the "couldn't have done it without technology" factor.

The sponsors and judges will determine the number of awards and the award categories.

Telephone interviews, and in some cases face-to-face interviews, will be requested by the Booz·Allen screening teams. These teams may elect to visit the finalists' sites in order to review in greater depth the entry, the system and the environment in which it is functioning.

ENTRY GUIDELINES

- The system must have been operational prior to July 1, 1991.
- Entries must be made jointly by the IS executive AND at least one of the business-unit executives for whom the system delivers value.
- Entries must be complete. Incomplete entries may be returned for elaboration or disqualified.
- Entries must be on 8.5x11-inch paper, one side per sheet.
- The entry form may be reproduced.
- Multiple entries from one company will be considered,

but each entry must be submitted separately.

- Vendors, public-relations and advertising firms, consultants and other third parties may NOT apply on behalf of another firm. They may forward this form to the "owner" of the system, or contact *CIO* Magazine to recommend that an entry form be sent.
- All entries must be computer-generated or typed; no handwritten entries will be accepted.
- Where feasible, an additional copy of the entry should be sent on a floppy disk. Electronic entries must be limited to word-processing and spreadsheet packages that are compatible with *Microsoft Word* and *Microsoft Excel* on either a PC or Macintosh platform.

1. COMPANY/BUSINESS UNIT

NAME OF PARENT COMPANY:

CITY, STATE WHERE HEADQUARTERED:

IF A COMPANY, IS IT ☐ PUBLICLY HELD? ☐ PRIVATELY HELD?

ANNUAL REVENUES:

INDUSTRY:

NAME OF BUSINESS UNIT OR ORGANIZATION:

CITY, STATE WHERE LOCATED:

NUMBER OF EMPLOYEES:

2. ENTRANTS

NAME OF ENTERING BUSINESS-UNIT EXECUTIVE:

TITLE:

NAME OF DIVISION, DEPARTMENT OR UNIT:

ADDRESS:

CITY:

STATE: ZIP:

TELEPHONE: FAX:
( ) ( )

NAME OF ENTERING IS EXECUTIVE:

TITLE:

NAME OF IS ORGANIZATION:

ADDRESS:

CITY:

STATE: ZIP:

TELEPHONE: FAX:
( ) ( )

3. SUPPORTERS

Please list four people who are willing to be interviewed with regard to the system, its development, its use and the value returned. At least one should be a member of the technology team that developed the system and should have played a significant role. At least one should be a primary user from the sponsoring business unit. The other two may be from either organization or represent suppliers, customers or others intimately familiar with the system.

A. NAME:

TITLE:

TELEPHONE:
( )

REASON FOR INCLUSION:

B. NAME:

TITLE:

TELEPHONE:
( )

REASON FOR INCLUSION:

C. NAME:

TITLE:

TELEPHONE:
( )

REASON FOR INCLUSION:

D. NAME:

TITLE:

TELEPHONE:
( )

REASON FOR INCLUSION:

4. THE NOMINATED ORGANIZATION

Please tell us about your organization (company, business unit, agency) in 500 words or less. Include information on:

- when the organization was founded;
- mission statement;

- major products and services;
- markets served, and
- any other data you believe relevant in terms of general background.

5. THE NOMINATED SYSTEM

Tell us about the nominated system and demonstrate its ROI by completing the following sections. Please limit your material to five pages.

- **Objectives:** Identify the primary business objectives of the IT investment.
- **Scope and Impact:** Identify the functions (e.g., customer service, manufacturing, planning) that were changed by the system, the nature of those changes and their impact on the business. Identify other business-change initiatives tied to the IT investment.
- **Alignment with Strategic Objectives:** Describe how the technology investment is aligned with the organization's strategic objectives, including any new business initiatives. Note any significant event that would help us evaluate the nominated system's value. Examples might include a merger, a new distribution channel or a significant regulatory change.
- **The Importance of IT:** Identify the different components of the overall business change (e.g., business reengineering, downsizing, cycle times). Explain the importance of the IT component to the overall business change.

6. TECHNICAL PROFILE

Briefly describe the technology of the nominated system. Please include the names of major vendors and products. If you prefer, you may attach a document containing a technical description of the system, providing it is no more than five pages.

NOTE: The examples provided here are meant to be illustrative, not all-inclusive.

- **Architecture** (e.g., mainframe, distributed, client/server)
- **Hardware** (e.g., mainframe/parallel processor, minicomputer/server, desktop computers, handheld/portable devices)
- **Software** (e.g., operating systems, database system, shells, application software)
- **Software development tools** (e.g., CASE, 4GLs, GUI developers, object-oriented development tools)
- **Networking/Communications hardware, software and services** (e.g., modems, routers, electronic-mail packages, carriers and public networks)

7. TRUTH OF INFORMATION/RELEASE

The following release must be signed by both nominating executives if the nomination is to be considered. Unsigned releases will invalidate the entry.

I hereby state that the information provided is true and complete to the best of my knowledge and belief.

I authorize the release and use of, in connection with the ESPRIT℠ Awards program, any and all materials furnished by me or others at the company contacted for this judging. I understand that information submitted on this entry form or subsequently gathered during the evaluation and judging process may be used in articles or any other type of publicity relating to the ESPRIT℠ Awards program.

I also authorize the release and use of my name, my company's name and my likeness, including but not limited to any photographs and any recording of my voice or image that may be taken of me for *CIO* Magazine. I agree that no compensation shall be due me or my company for such usage.

I recognize that failure to meet these conditions or to provide sufficient material that can be published can cause the nomination to be rejected at any point in the process at the sole discretion of the sponsors.

SIGNATURE OF NOMINATING BUSINESS EXECUTIVE: _____

DATE: _____

SIGNATURE OF NOMINATING IS EXECUTIVE: _____

DATE: _____

CHECKLIST

Have you filled out...?

- ☐ Company/Business-Unit, Entrants and Supporters Information
- ☐ Return on Investment Chart

Have both entrants signed and dated...?

- ☐ Truth of Information/Release

Have you included on separate pages...?

- ☐ Nominated Organization
- ☐ Nominated System
- ☐ Technical Profile
- ☐ Additional Return on Investment Material

Have you checked off...?

- ☐ Other Editorial Opportunities
- ☐ How you learned about the ESPRIT℠ Awards program?

8. OTHER EDITORIAL OPPORTUNITIES

If you are not selected as an award recipient, are you willing to be contacted for inclusion in other articles in *CIO* Magazine? Yes ☐ No ☐

How did you learn about the ESPRIT℠ Awards program?

- ☐ *CIO* Magazine
- ☐ Booz·Allen & Hamilton
- ☐ IS staff member
- ☐ Other publications
- ☐ Other (please identify) _____
- ☐ Vendor
- ☐ Academician
- ☐ Consultant
- ☐ Systems integrator

9. QUANTIFYING RETURN ON INVESTMENT

Directions

- The table below provides a framework for breaking down costs and benefits. Feel free to break down any line item into additional components, or to add new line items if necessary. Please explain how the figures were arrived at, on separate sheets if necessary.
- In quantifying costs and benefits, every effort should be made to quantify strategic and "intangible" benefits (e.g., competitive positioning, risk management). It would be helpful to attach any documents you have prepared that explain the system's costs and benefits.
- You may also include your own return on investment calculations and frameworks to further explain your return on investment. These can be attached to your nomination form.

Guidelines for Quantifying Return on Investment

- Provide return and investment figures five years out from initial implementation. Where the system has been in operation for less than five years, you may project future investments and returns *based on historical data*.
- All investments and expenditures made before implementation should be included in year "zero."
- Distinguish actual costs and benefits from projected costs and benefits.
- To the extent the nominated system replaced older technology, the system investment reflected in the tables should be net of corresponding salvage values and ongoing costs.
- Return and investment figures should be stated on an approximated after-tax basis.

NOTE: The examples provided below are meant to be illustrative, not all-inclusive. All numbers are subject to verification.

Return:	**Year 1** 19 ___	**Year 2** 19 ___	**Year 3** 19 ___	**Year 4** 19 ___	**Year 5** 19 ___	**TOTAL**
Incremental profits from enhanced revenue (e.g., new revenue streams, productivity improvements)						
Reduced operating costs (e.g., labor, material)						
Reduced capital investments (e.g., capital equipment)						
Reduced inventory						
Indirect cost avoidance (e.g., avoided hiring, fines, fees)						
Total Annual Return	**$**	**$**	**$**	**$**	**$**	**$**

Total Return: $

Investment:	**Year "0"** 19___-19___	**Year 1** 19 ___	**Year 2** 19 ___	**Year 3** 19 ___	**Year 4** 19 ___	**Year 5** 19 ___	**TOTAL**
Technology purchases (e.g., hardware, software, lease payments, amortization)							
System development and implementation (e.g., systems integration and consulting fees, initial training)							
Ongoing system maintenance and enhancement (e.g., updating system, maintaining and replacing software, adding users)							
Ongoing system operations (e.g., ongoing training and consulting, help desks, other ongoing support)							
Non-systems operational charges (e.g., increased labor or inventory, early retirement program for laid-off employees)							
Total Annual Investment	**$**	**$**	**$**	**$**	**$**	**$**	**$**

Total Investment: $

Total Return on Investment: $
(Total Return minus Total Investment)

The 1993 ESPRIT℠ Awards

Honoring Excellence in Strategic Partnering for Return from Information Technology

Sponsored by *CIO* Magazine and
Booz·Allen & Hamilton

CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

BOOZ·ALLEN & HAMILTON

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Actors win Oscars.
Writers win Pulitzers.
Musicians win Grammys.

Now there is an award for you—
The ESPRIT.℠

Honoring Excellence in Strategic Partnering for Return from Information Technology

Has your Information Technology (IT) investment done more for your company than just bring it into the information age? Can you demonstrate significant cost savings or increased bottom-line profits as a result of an innovative IT solution? If so, that's an achievement that deserves to be recognized and honored because your company is not merely using IT, it's utilizing IT to enhance the company's business value.

If your technology investment is paying off, we want to hear about it. Winning entries will be featured in the January 1994 issue of *CIO* and honored at a special awards ceremony in early 1994.

For more information, see the ESPRIT℠ Awards entry form bound within this issue of *CIO*. If the entry form has been removed, call Mina Ahn at (508) 935-4449.

ESPRIT℠ *sponsored by*

CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

BOOZ·ALLEN & HAMILTON

and now we can do a major release of the CRS once every month." In total, there have been about 20 such releases, which typically involve sprucing up the way screens look

Customers can get up-to-the-minute, accurate and consistent information about rooms and rates from hotels, the reservation center or travel agents.

or improving functionality and speed. Training classes for such changes generally take an hour or two a month, and online help is available.

The system Hyatt used to book reservations from 1983 to 1990 did not provide a real-time link between individual hotels and the central reservation center, and manual updates from the hotels couldn't keep up with the vagaries of the travel industry. While customers could make reservations easily enough via an 800-number, information regarding room availability and rates was often inaccurate and incomplete. A customer making reservations through a travel agent didn't fare any better and was even more likely to get skimpy descriptions of special packages, because travel agents used airline CRSs to make the reservations, and these carried only static information. In addition, a customer might receive different rates, depending on where a reservation was made.

The ability of hotels to update room availability electronically and transmit that information to Omaha was just the first step toward providing a comprehensive and reliable system, and enhancements continued over the first six months. Kerr reports that the rollout of the system went "better than we had ever hoped it would.... We literally had no software failures in that time."

A significant new release of the CRS went online at the end of February this year. According to Kerr, this release represents a rewrite of approximately 30 percent of the system from 1990. In addition to being connected to all of the property-management systems at the hotels—which keep track of room inventories, rates, guest records, staffing and other aspects of hotel administration—the CRS is now more accessible to travel agents. Customers can get up-to-the-minute, accurate and consistent information about rooms and rates from hotels, the reservation center or travel agents. "We've completely changed the rate and quotation system," Kerr said. "We can keep track of the rates for each day, special deals, two- or three-day packages, and provide complete and accurate descriptions of packages."

The new release also improves Hyatt's ability to provide guest-recognition services. According to Kerr, using special codes to designate room preferences, such as nonsmoking or high-floor, is relatively easy. Much more difficult is information about a guest that doesn't fall into a code category. For example, if a guest has visited the same hotel six times in five weeks, the CRS will instantly provide the front desk with this information. "If you're spending a lot of money at a hotel over a short period of time, you shouldn't be treated like a first-time guest every time you check in," Kerr said. Armed with specific guest-history information, a hotel can do something special, like put cookies in a room or prepare a birthday cake. "Our job is to make guests feel as at-home as possible when they're away from home," he said. To that end, Hyatt's CRS is an important tool, and the MIS department will continue making enhancements. ■

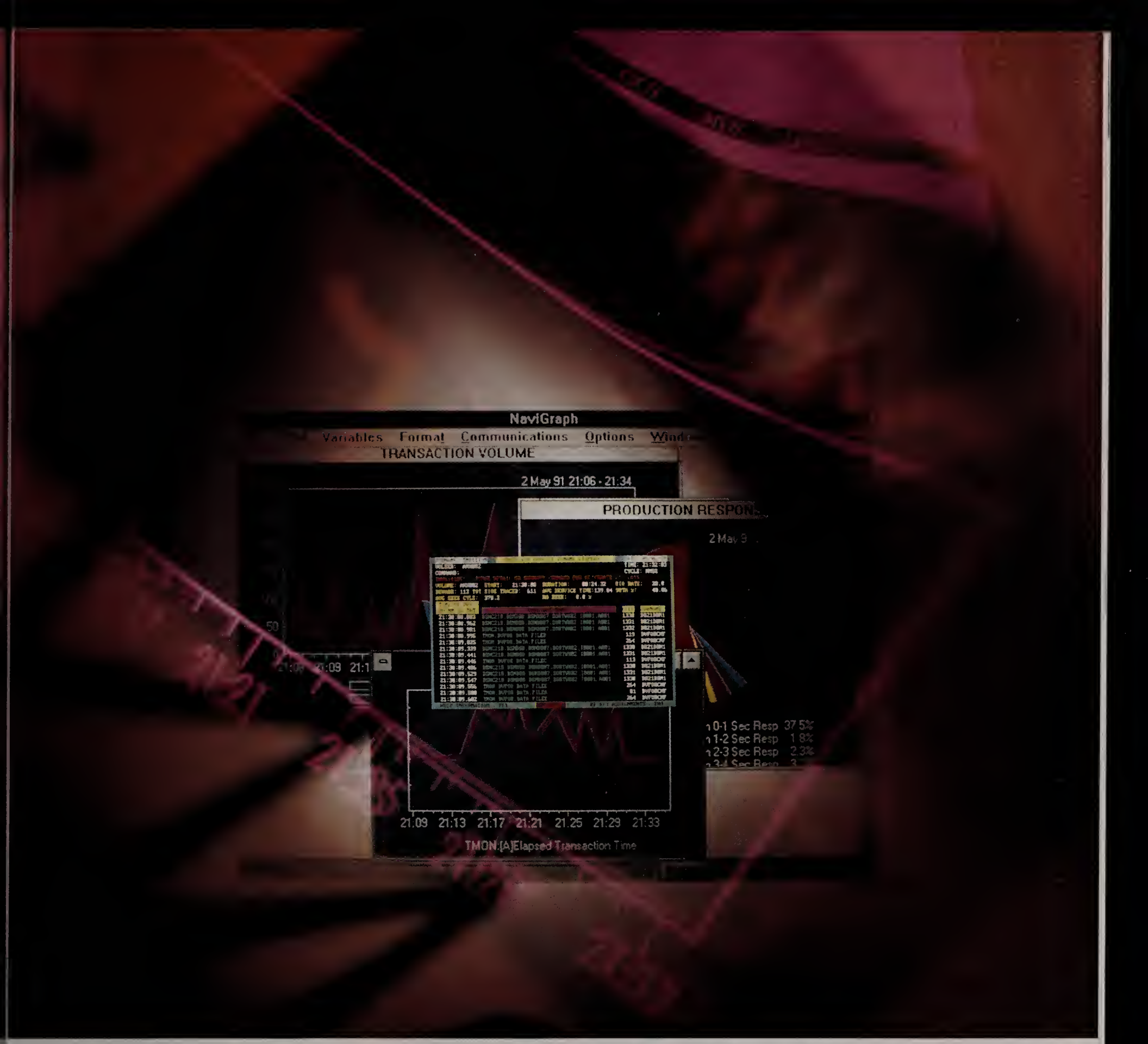
USAA

Document Imaging

In October 1988, *CIO* ran a story about USAA's efforts to install an optical-disk-based imaging system. The goal of the San Antonio, Texas-based insurance and financial-services company was to eliminate paper in its property and casualty policy-services operation with a $10 million, 1,300-workstation document-processing system. "We will be able to give better service for sure," said Donald Lasher, president of the IS division, at the time. In addition to improving customer service, USAA hoped that the system—which was to be shared among 2,000 employees in the operation and store 300 million pages of documents electronically by 1995—would save 39,000 square feet of office space and free up 100 clerical employees for jobs elsewhere throughout the company.

The spelling of his name wasn't the only thing *CIO* got wrong about Donald Lasher in 1988. Back then we reported that "Lesher couldn't be more enthusiastic about image technology." As it has turned out, Lasher *is* more enthusiastic about it—a lot more. That's not surprising, considering that all his expectations were met or exceeded, and he realized a pretty significant fringe benefit to boot.

When the imaging system was completely implemented in March 1990, it signaled the end of the paper-based era for the policy-services operation. Previously, a customer with a policy question often had to wait for a representative to return a call while pertinent documents were phys-



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ically retrieved from file cabinets. Imaging puts documents literally at the fingertips of every representative. Lasher, who still heads up the IS division, reports that customer service has improved immeasurably as a result, because most problems and questions are resolved on the spot.

The 39,000 square feet of space once devoted to storage have been converted to office space, Lasher reports, and 160 clerical workers have been reassigned within the company (60 more than were originally expected). Moreover, the company can now keep backup copies of records at another site. "Because of space [limitations], we had only one copy of each document in our archives," Lasher said. "If there ever was a fire, we'd be in trouble."

The stacks of documents that used to dot the desks of representatives are gone, and productivity is up. Priority work doesn't get "buried," because it is automatically assigned by the system. There's also no chance of misplacing important documents. According to Lasher, the occurrence of "holdovers," or work that had to be taken home for completion, has been practically eliminated.

The biggest benefit of the system is one that USAA hadn't counted on. "We knew imaging would generally improve management and workflow," Lasher said, "but we weren't prescient about [specific] things." For example, managers can channel work to representatives according to expertise, monitor backlog right from their screens and distribute workflow on the fly—all without getting up from their desks.

The image system's use and capacity have expanded beyond the original plans. Today, USAA's pol-

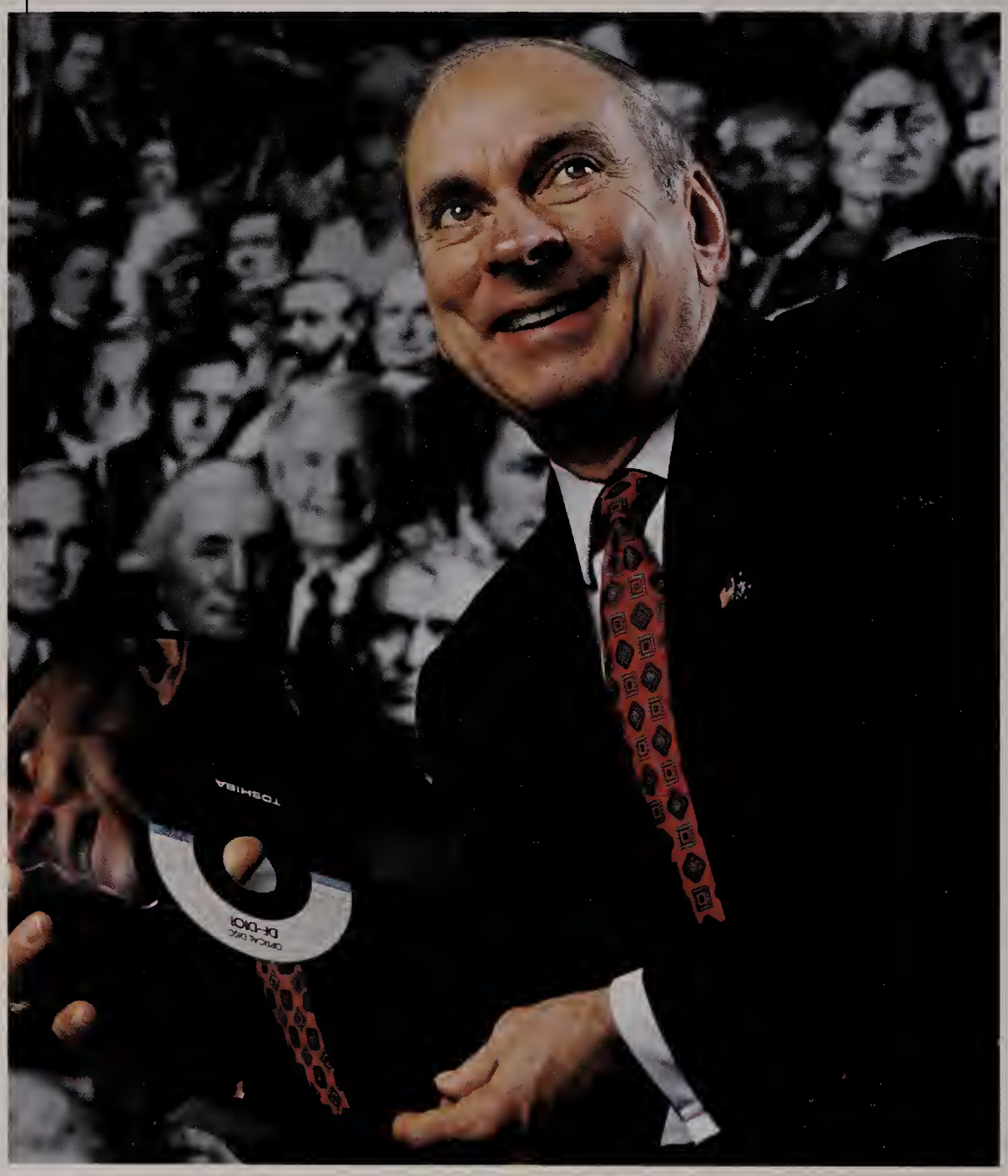
Managers can channel work to representatives according to expertise, monitor backlog right from their screens and distribute workflow on the fly—all without getting up from their desks.

icy-services operation has 2,500 employees—500 more than originally planned for—who use about 1,600 terminals equipped with the system. Given the volume of documents added each day, Senior Director of Systems Architecture Charles A. Plesums expects the system to contain well over one billion pages of electronic documents by 1995. That's more than three times the original goal.

Plesums, who oversaw installation and end-user training, is satisfied with the incremental approach the company took. "In light of installing the software and making sure everything checked out, 100 [systems] per month was a comfortable pace."

The biggest stumbling block turned out to be the CICS-based operating system the application ran on. Since the project entailed integrating a lot of different hardware and software, and IS was primarily experienced with IMS-based systems, troubleshooting and maintenance required some extra head-scratching. "We had little expertise in CICS," Lasher said. "We learned on the job, but the pace was frenetic." CIO

DONALD LASHER: *service on a silver platter*



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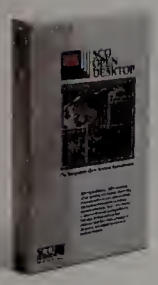

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1/93

WORKFLOW SNAPSHOT

William Beaumont Hospital

Troy, Mich.

Department/Function: Accounts receivable

Old Flow: Incoming payments entered into batch billing system by data-entry clerks; later, these funds allocated to patient accounts by receivables clerks, with second bills generated for any balances due

New Flow: Imaged payments routed directly to receivables clerks, who generate second bills immediately

Benefits: By shaving three to four days off the time needed to generate second bills, funds brought in that much sooner; four job functions eliminated

Technology: Unisys Corp. Event Manager workflow software and image system

PATHS OF LEAST RESISTANCE

Until recently, workflow redesign—the untangling and streamlining of outmoded work processes—has typically been tied to image-processing or workgroup-computing efforts. But its significant rewards suggest it is a worthy end in itself.

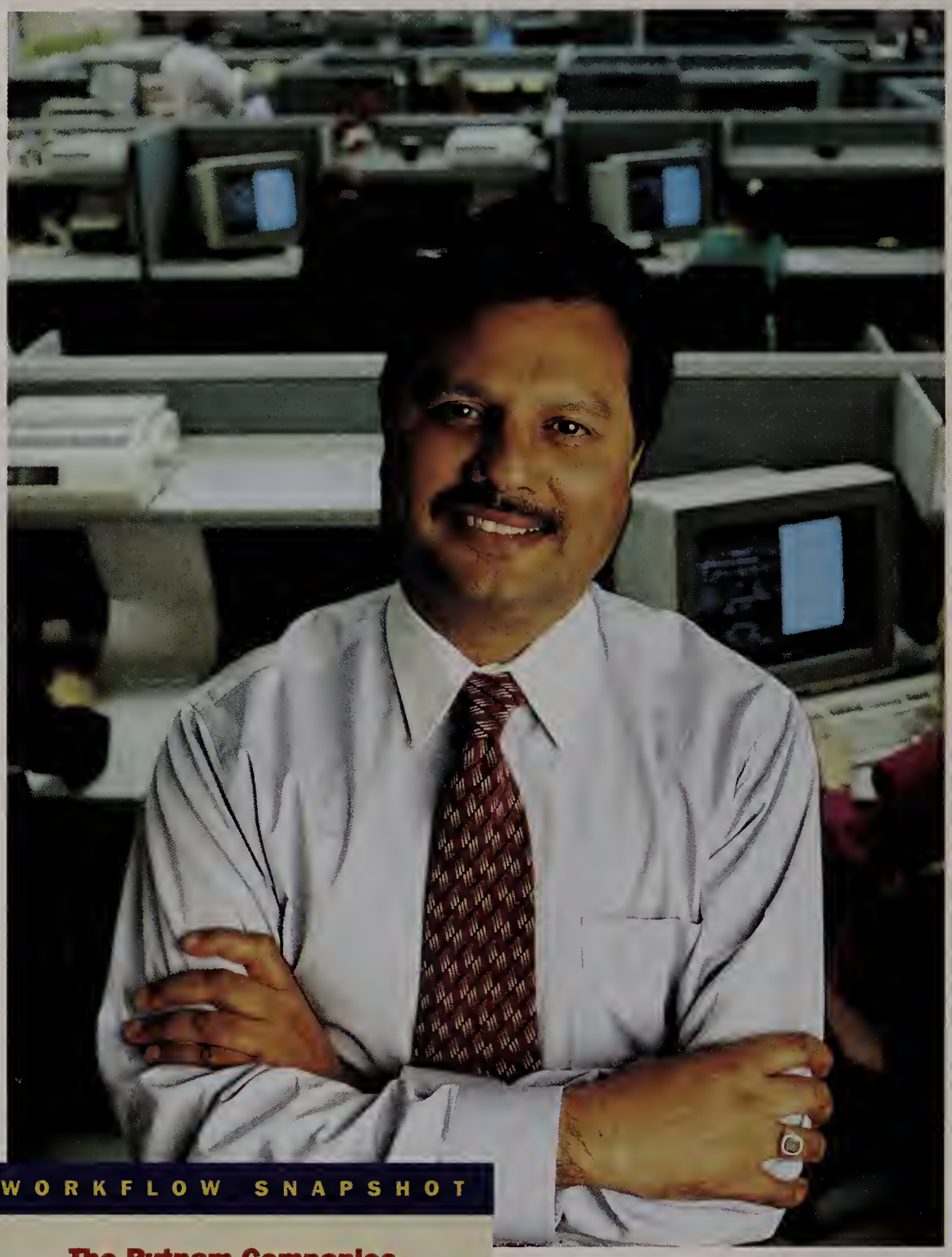
BY RICHARD PASTORE

Paving the cow paths—it's a tired old saw we wish would fade away. Happily, it seems to be doing just that, even in the tradition-laden, paper-intensive back offices of insurance and financial firms, hospitals, distributors and the like. Instead of laying automation over their conventional paper-based workflow, more and more companies are first reengineering the flow itself—untangling and streamlining work processes that long ago outlived their rhyme and reason. The payback, besides the banishment of bovine banalities, comes in improved customer service and productivity gains as high as 60 percent.

Work-process reengineering is not new. But in the past it's been embedded in applications or relegated to being an afterthought triggered by some technological catalyst—typically image processing or workgroup or client/server computing. "We sort of ignored it, until our new image system forced us to look at the paper flows," said one business-side manager at a large insurance firm. Now more people are realizing that workflow redesign is a prime objective in itself. "The technology is just an enabler," said Gavan Taylor, managing director of IS at Boston-based financial firm The Putnam Companies. "Without refining the workflow, you won't get all the benefits," such as the 20 to 60 percent productivity boosts

PAUL PEABODY *was surprised to learn of physicians' fondness for red ink.*

PHOTO BY JOHN MURESAN



GAVAN TAYLOR *sees the ultimate benefit of workflow analysis as triggering a redefinition of people's roles around processes rather than tasks.*

WORKFLOW SNAPSHOT

The Putnam Companies

Boston

Department/Function: Investor services

Old Flow: Investor correspondence manually sorted and routed by mail clerks rushing to meet federal requirements that mail be processed by 4 p.m. on day received

New Flow: Mail scanned by clerks into image system that automatically prioritizes and routes it to appropriate departments and employees

Benefit: Time to move piece of mail to its appropriate destination reduced from 3.5 hours to 30 minutes; total correspondence handled last year increased 40 percent without additional staff

Technology: IBM ImagePlus image system with File Application Folder and Distribution Management workflow components

reaped by Putnam across various departments.

Like many companies considering image processing, computer distributor Ingram Micro Inc. initially figured the technology alone would significantly boost productivity in its accounts-payable department. "We started off just looking at imaging but really found the value in the workflow," said Steve Graham, senior director of systems development at the Santa Ana, Calif., company. Ingram combined workflow-management software from Computron with imaging from Wang Laboratories to achieve a 50 percent productivity boost. Now Graham is contemplating workflow redesign in other areas of the business, independent of imaging. "Any process that requires upward approval is a good workflow project, with or without image," he said. Image-technology vendors have come to the same conclusion; some now offer their workflow tools independently of image (see related story, Page 44).

Every employee is a workflow expert, and the contribution of each is crucial to the analysis and redesign.

Productivity and customer-service improvements are the most prominent paybacks for workflow reengineering. A subtler benefit is the closer bond forged between IS and users by the teamwork inherent in the process. And in the grander scheme, eliminating or combining discrete tasks into more multifunctional work processes can create a broader, more business-focused worker mind-set.

Since workflow redesign is really a subset of business-process reengineering, it's no surprise that the hurdles are similar. The first obstacle is getting started; analyzing existing workflows can be an exercise in tedium. After that, managers should expect a visitation from that psychological specter, resistance to change. Some resistance is inevitable; workflow reengineering not only changes the flow of documents or data, it also requires workers to alter their skill-sets, their work habits, even where they sit and with whom they interface.

The unavoidable first step in any workflow project is also the most time-consuming: to thoroughly analyze existing flows. One insurance

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firm spent six months doing this; only four weeks were needed to design and prototype the new flow. Reengineering teams must document every movement of data, questioning who comes into contact with it and why. "The hardest part is going through each process and defining which steps you really need," Graham said. "You'll find a lot of extraneous tasks that nobody knows the reasons for doing." Indeed, work processes have a way of evolving over time into twisting patterns that would have boggled Rube Goldberg.

Every employee is a workflow expert, and the contribution of each is crucial to the analysis and redesign. In preparation for an image-processing pilot, The Boston Co., a Beantown financial-services firm, held a promotion to solicit employee workflow suggestions on how to identify and exterminate workflow "snakes." Employees whose suggestions were implemented won T-shirts and rubber snakes. Some of the more than 200 suggestions helped the firm shrink the origination cost of new jumbo mortgage loans by 40 percent.

In addition to snakes, The Boston Co. threw old-fashioned spreadsheet technology at the problem. "We built spreadsheets using noun-verb pairs to represent the work activities," explained Wynelle Hurley, assistant vice president of advanced technology. "If the same noun-verbs showed up more than once, it was a sign we might have redundancies." In the end, workflow changes made the most of the Plexus Software image technology, Hurley said.

WYNELLE HURLEY: *If work becomes easier, resistance to changes drops.*

A key but sometimes overlooked detail of workflow change is the repercussions that it may have on other departments or functions. At William Beaumont Hospital, a 1,100-bed facility in Troy, Mich., a change made to nurses' work-process routines had unexpected ramifications that could have jeopardized patient care. At the end of their shifts, nurses customarily wrote patient-condition summaries on charts for physicians coming on duty, and highlighted those summaries in red ink. "When we automated our nursing documentation, it was double-spaced and very legible, but it didn't stand out in the red ink the physicians were accustomed to," said CIO Paul Peabody. "We didn't anticipate that, and we spent a lot of time fixing it." The hospital used Unisys's Event Manager workflow and image-processing software for both patient-care and administrative applications.

Once the analysis is completed, it's time to reengineer. Typically, organizations try to streamline the flow, excising all redundant and non-value-added steps and bottlenecks while bringing automation to manual parts of the process (see accompanying "Snapshot" boxes). This can be done with an eye to the specific technology that will eventually be implemented. Like an overhead transparency, the technology should be laid over the revised workflow model to show how well its capabilities match and support the changes being considered. "We identify from the workflow analysis what changes we expect, and then we factor in

WORKFLOW SNAPSHOT

Ingram Micro
Santa Ana, Calif.

Department/Function: Accounts payable, handling 500,000 invoices annually

Old Flow: Incoming invoices sorted according to vendor and parceled out to clerks dedicated to specific vendor accounts; 75 percent of the work—data entry and other general tasks—required no vendor-specific expertise

New Flow: Invoices from all vendors flow through one pool of clerks for routine processing; problem invoices forwarded to a smaller pool of workers with vendor-specific expertise

Benefit: Invoices processed 50 percent faster; volume increased 30 percent in the first year without adding staff

Technology: Computron Epic/Workflow software, Wang Laboratories Inc. image processing

PHOTO BY GEORGE SIMIAN

Trail Blazers

As workflow reengineering comes into its own, vendors are targeting the market with end-user aids that are independent of image technology

Traditional image-processing sources, such as Plexus Software and Sigma Imaging Systems Inc., are selling their workflow wares separately from their image products. "We removed workflow from the application altogether, and we're now focusing on process redesign," said Steve Mitchell, vice president of worldwide marketing at Plexus.

End users, Mitchell said, don't want to go back to IS every time business relationships change and they need to tweak workflows. The graphical interfaces of tools from Computron, XSoft and others allow end users to rearrange, add or delete icons to alter the flow of work among employees or departments. The most versatile tools also provide the means to design automatic work-status monitoring and reporting, usage monitoring and bottleneck analysis.

There are many tools that can automate or modify a small segment of the workflow. Computer SI Corp. and Folio Corp., for example, target the process of document gathering, printing and publishing. A few products help with the analysis of existing workflows, identifying bottlenecks and redundancies. They can also be used to test flow models with what-if scenarios. Action Technologies, the vendor of one such tool, launched its "Workflow Institute" last summer to offer courses in workflow analysis and redesign to users and consultants. *–R. Pastore*

the system," Peabody said.

Frequently the revised flow requires further tweaking to bring it more in line with the technology's abilities. In fact, workflow redesign is rarely ever "finished." Rather, it's a continuous process that begs for reexamination. "It's not reasonable to expect to get everything perfect on the first go-around," said Douglas C. Walters, senior vice president of special operations at Continental Insurance in New York. "I think we could make another pass now and probably make noteworthy improvements." Continental revised workflows less than a year ago with a customized version of Lotus's Notes workgroup software.

There's no pat answer to the question of who should sponsor workflow reengineering, but many lay the champion's mantle on the users' shoulders. "The business side has to lead the workflow redesign, because that's the recipe for success," said Diane Smigel, vice president of corporate information services for John Hancock Financial Services in Boston. IS's role is more one of support—assisting with analysis and communicating the technology's capabilities. Any attempt by IS to dictate work changes will invariably alienate the users, she said.

Changes intended to improve the overall flow may seem unreasonable or arbitrary to workers focused on narrow tasks, and the majority of workers will likely resist giving up their tried-and-true methods.

However, IS can take the lead, provided it involves the users. At Ingram Micro, IS spearheaded the workflow initiative, including the justification effort. Graham attributes the success of this approach to Ingram's prevailing corporate culture. "IS plays a strong role in the direction of the company, and we're closely tied to user departments," he said. "But if there's no user buy-in, it's not going to work."

No matter who the sponsor is, teamwork is a must. "There has to be openness on both parties' parts to listen hard, to be committed to making business progress," said Continental's Walters. "When people do that, they seem to form a team that accomplishes a lot."

Successful workflow teamwork can forge the tighter IS-user bonds that management gurus have been advocating for years. "Workflow reengineering has been a catalyst for building a stronger relationship," said Jeanne Kleene, director of technology resources at John Hancock Mutual Funds, a division of John Hancock Financial Services, which uses an image and workflow system from FileNet Corp. "We get a better understanding of the business, and they get a better understanding of technology's capabilities."

IS and the business side also grew closer at Pacific Mutual Life Insurance Co. in Newport Beach, Calif. According to Alan Wuest, manager of policy benefits and services, workflow redesign "changed the way we work with IS. We're more in contact [with IS] about what we're working on and vice versa." Pacific Mutual implemented an image system with workflow from FileNet in the late 1980s, and it now has 23 million images online.

Users who are members of the redesign team readily buy into the concept of change. But changes in-

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DOUGLAS C. WALTERS *stresses that workflow revision should not be considered "finished," but should be repeated periodically to extract additional benefits.*

tended to improve the overall flow may seem unreasonable or arbitrary to workers focused on narrow tasks, and the majority of workers will likely resist giving up their tried-and-true methods. "It's hardest to make changes when people are used to a certain way of doing things and they don't understand the overall process of the work," said David King, president and CEO of John Hancock Fund Services, another Hancock division.

Business-side folk aren't the only ones opposed to change. Ask the users about opposition to change, and they may point a finger back at IS. At Continental, "we had to convince some DP traditionalists that these new tools and approaches complemented the mainframe environment and were not a threat to their positions," Walters said.

Fortunately, resistance can be overcome. Continental tried several reinforcements, such as explaining how employees would benefit from the changes and instituting an intensive 4½-day on-site training regimen. Even so, some employees were more comfortable with the old methods and reverted shortly after the changes were implemented. "We noticed use of the new system trailing off, so we did some refresher training and really hammered at the benefits to them," said Joe King, a former IS manager at Continental and now president of Crossroad Partners, a Shrewsbury, N.J., consultancy for workflow reengineering in the insurance industry.

The Boston Co.'s snake promotion was in part intended to lower worker resistance, according to Hurley. "The key was to show them quickly and simply that the changes could have significant payback and make their work easier," she said. "Then they saw the effort as worth their while."

Once workers get over the shock of change, they may realize that with fruitless tasks eliminated, their value to the company has improved—as have their career prospects. "The changes allowed me to grow in this job much more than I would have otherwise," said Kim Holt, a technical coordinator in Putnam's adjustments department. Instead of focusing on "moving paper around, I had time to get involved more in management, thinking about new ventures we could try."

Carried to its greatest potential, workflow change could help transform entire organizations, replacing a task-specific structure with one that's more integrated, multifunctional and focused on the broader business. "It's good to use workflow to drive out costs, but most IS groups stop there," said Thornton May, director of research at Tenex Consulting in Burlington, Mass. Taken to a higher level, workflow should be used to convert a fragmented, task-oriented culture to one that's united and focused on the larger business issues of competition and profitability, May said.

This is happening now at veteran workflow sites like Hancock, Pacific Mutual and Putnam. "Workflow changes job skills, so instead of being defined by specific tasks, we're now defined by process," Putnam's Taylor said. Even if the changes aren't that profound, it beats being defined by cow paths, paved or unpaved. CIO

PHOTO BY KENT HANSON

WORKFLOW SNAPSHOT

Continental Insurance
New York

Department/Function: Large-client accounts

Old Flow: A 200-step, paper-based account-management process, much of it checklist routing and status reporting

New Flow: Electronic account documents and files now routed automatically, with automatic status-report generation

Benefit: Eliminated 20 percent of account-management steps—primarily checkoffs, notification and status reporting—and reduced margin for manual customer-service errors, helping to retain important accounts

Technology: Lotus Development Corp.'s Notes workgroup software, with custom-written workflow-automation facilities

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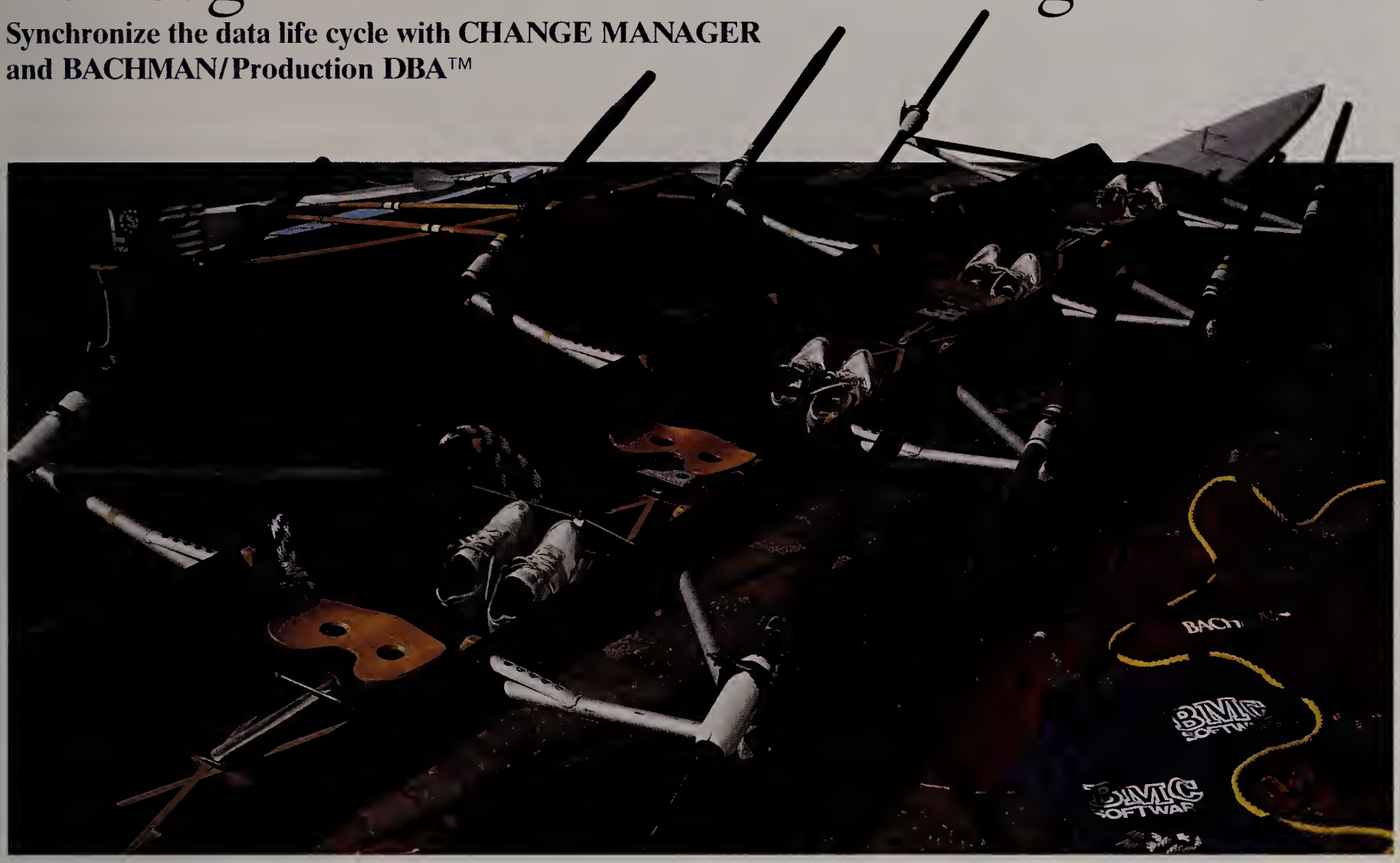

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SUPPLIER'S DEMAND

IF MISERY LOVES COMPANY, then IS executives vexed by the difficulty of staffing up to downsize mainframe applications can find comfort in the fact that their suppliers are facing the same problem, on an even larger scale. For most companies, life goes on while they shift business applications to smaller, less expensive processors. But for vendors whose livelihood comes from the sale of products to support downsizing and the development of distributed applications, securing a steady supply of skilled technicians to develop those products is a matter of survival.

Client/server development requires a combination of skills rarely found in a single person. "We're finding it very difficult to locate the individuals we need," said Lynn Anderson, vice president of human resources and administration at Candle Corp., a supplier of systems-software management and development tools based in Santa Monica, Calif. "It's a relatively new technology, and not many people have that set of technical skills."

Mitchell Kertzman, chairman and CEO of Powersoft Corp., takes a philosophical view. "As in the emergence of any new platform, it takes a while to build an infrastructure of skilled people," he observed. Powersoft, headquartered in Burlington, Mass., is one of the oldest companies in this very young field and, by most estimates, the market leader in supplying development tools for commercial client/server applications, yet the company has been shipping products for less than two years.

BY MICKEY WILLIAMSON

ILLUSTRATION BY RANDY LYHUS

Kertzman said that finding people with technical know-how in areas as diverse as relational-database, graphical-user-interface and network-operating-system technology is only half the battle. Developers must also have the capacity to understand the challenges that customers face and the problem-solving orientation needed to provide solutions.

Prospective employers are often willing to pay salary premiums as high as 25 percent to attract new employees.

While demand is increasing, client/server developers are likely to be "wrapped up in projects," with little inclination to change jobs, according to executive recruiter Dan Robitaille at Sullivan & Cogliano, a personnel firm in Waltham, Mass. The dearth of qualified applicants for client/server positions is particularly striking, considering that several hundred thousand computer-industry jobs have been lost in the past few years, and hundreds of developers are likely to apply for a single opening, he said. The result, according to Robitaille, is that prospective employers are often willing to pay salary premiums as high as 25 percent to attract new employees.

High salaries alone, however, are often not enough to bring skilled client/server technologists on board, many vendors recognize. Much depends on "the nature of the project and the role that the person will play in it," Robitaille said. "Because it's a new technology, positions tend to be very visible. The opportunity and the challenge are very attractive to some people."

Candle stresses to potential recruits the opportunity to gain experience in "state-of-the-art technology development using the latest tools and environments," Anderson said. "There's always a sense of challenge and interest that you can use as an enticement."

At CASE tool vendor Intersolv, in Rockville, Md., Vice President of Marketing Peter Privateer oversees product management of the company's line of tools for developing distributed applications. He said the "carrot" used to attract new hires is the message that "we're out there on the cutting edge, pioneering new territory. We're going where no one has gone before, and to some individuals that's a very attractive prospect."

Because Intersolv's approach to distributed development involves using the mainframe as the server, developers need to understand both mainframe and PC issues, Privateer said. This combination is so rare that the company usually finds people experienced on one platform and then trains them on the other.

Intersolv is not the only vendor to downplay specific client/server requirements in favor of a broader set of attributes. "Our notion is to find people who are smart and who have fairly broad backgrounds in terms of application development and general network-application knowledge," said Charles Digate, president and CEO of Beyond Inc., a maker of E-mail products in Cambridge, Mass. "Then we provide a lot of training, much of it specific to our product line."

Ronald Sherma, president of CASE vendor Popkin Software Systems Inc., in New York, said client/server skills do not figure prominently in his company's employee searches, simply because they are so rare. "We look for the brightest, most flexible people we can find, and if they don't have client/server experience, they'll get it in-house."

"It's like a football team," he added. "You look for the best athlete, and that athlete will be able to serve you in a number of ways. When you get smart people, they can pick up the rest of the skills they need."

OCCASIONALLY, SUPPLIERS find they need someone with intimate knowledge of a particular hardware configuration, database-management system or industry in order to satisfy a customer's requirements. Then they turn to independent contractors. "Generally we find that more-specific knowledge by vertical market is available through third-party consultants and development organizations," said Digate. "We have to be more horizontal and generic in our approach."

"When we need experience in a specific platform, very often we'll go outside to a consultant," said Sherma. "To me, that's a sensible way to outsource."

Powersoft has built a business out of training programmers in client/server development, a classic example of extracting advantage from necessity. People with the requisite skills were unknown when Powersoft began staffing up, so on-the-job train-

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ing was a way of life. "We didn't have a formal methodology for training ourselves at the beginning," Kertzman remarked. "Growing a company like ours is a sort of group-learning experience."

The secret of retaining good employees "is a function of compensation and long-term incentives." *–Charles Digate*

Today, however, more than 5,000 programmers have completed the company's course in developing applications with its tool, PowerBuilder. Participants in Powersoft classes include both employees of the company's customers and individuals—often unemployed—who pay the tuition themselves in hopes of finding jobs with Powersoft customers.

Companies that invest in equipping their employees with the requisite skills typically take pains to keep those people on the payroll. Most use a combination of compensation and recognition to make staying on the job more attractive than defecting to another vendor. CEOs also pay close attention to creating the right kind of corporate culture (see related story, Page 54).

Digate differentiates between the skills needed by software engineers who develop products and those needed by employees who help Beyond's customers tailor those products for their own needs. "In terms of helping customers derive the most value out of the software, we find it appropriate to invest heavily in personnel," he said.

The secret of retaining good employees "is a function of compensation and long-term incentives," Digate said. "We are a venture-capital-based company, so we have a very aggressive stock-option program geared toward long-term retention of employees."

At Intersolv, all employees are part of a performance-based bonus plan, dependent on corporate year-end profits. An individual-incentive compensation program is set up for each employee, with part of the

There's No Place Like Work

A generous, flexible management style keeps Powersoft's talent pool well-stocked

Powersoft Corp., in Burlington, Mass., has done such an excellent job training its staff in the skills required for client/server development that now it must work equally hard to retain the hot properties it has created. "Keeping people is not a mystery," said Chairman and CEO Mitchell Kertzman. "We pay well, but you can't keep people solely by golden handcuffs. The real thing that keeps people here is the quality of the work environment."

The quality of Powersoft's work environment is evident both in the values it espouses and the means it uses to promote those values. At the end of last year, for example, the company hosted an employees' retreat at a New Hampshire ski resort, where Kertzman presented the first Powersoft awards "for individuals that most exemplify our culture," characterized by "team spirit [and] a positive, quality-oriented and selfless attitude." All employees were invited to submit nominations, from which three winners were chosen by an anonymous committee. "The emotional response by all the employees to the recognition of the peers that they admire most is the kind of thing that motivates people to stay and work here," Kertzman said.

In addition to seeing their names engraved on a plaque at company headquarters, winners get an extra week off and vouchers redeemable only for travel with a spouse or companion. The latter reward enhances Powersoft's position as a "very family-oriented company," Kertzman said. "We don't expect Powersoft to be the only thing in [our employees'] lives. More and more, people don't want to give every waking hour to the company; they want to share time with their families, and we provide an environment that lets them do that."

Asked if that meant that employees didn't have to invent an excuse for their absence in order to stay home with a sick child, Kertzman laughed. "Absolutely," he said. "I have two young daughters myself, and I've had to do that, so I certainly understand when other people have to do it."

The result of management's attitude toward its employees is that working at Powersoft is "kind of fun," said Human Resources Manager Traci Weaver. "Very few people leave the company."

–M. Williamson

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bonus check reflecting how well the company did as a whole. For developers, the program is "heavily weighted" toward the profitability of the product with which they are involved. "Clearly, if we have successful products, then they're going to make a lot of money," Privateer noted. "In general, we can be very competitive with the industry because of the profit incentives that we offer."

"We pay very well and do all the standard things, but the most important thing we do is to allow our developers an immense amount of flexibility in hours and a lot of creative flexibility."

–Ronald Sherma

Candle offers an annual cash prize, known as the president's award, to the person who has made the most significant contribution to the company's development efforts. Winners are chosen by development managers and a review committee consisting of the company's president and chairman.

BEYOND CASH awards, other forms of recognition by management, peers and even customers can be a powerful tool in the hands of vendors determined to motivate and retain employees with specialized skills. For example, Candle established a group, called Genesis, consisting of the company's leading technology architects and most-skilled developers. The group's charter is to develop client/server applications for heterogeneous platforms.

"We wanted to carve out a group that has a specific focus and emphasis on this new technology area," Anderson explained. The name Genesis was chosen because it is "appropriate to the new generation of products and services that will be coming from this area of the company."

Popkin Software combines financial incentives with an appealing management style to retain employees. An annual bonus reflects "how much product [developers] have out there, and how well it's been received," Sherma said. "We pay very well and do all the standard things, but the most important thing we do is to allow our developers a very wide latitude. We allow an immense amount of flexibility in hours and a lot of creative flexibility."

Both Popkin Software and Candle provide special forums that allow developers to showcase their achievements for their peers. At Candle, these presentations offer "a chance to stand up and show some of the important findings and what they have learned that other teams can use in their own work," Anderson said. "This leads the technical people to recognize where the excellence is coming from and who the primary technology leaders are within each team."

Popkin Software and Intersolv take pains to communicate customer praise to their developers. Popkin Software's sales representatives are urged to ask customers who comment favorably on some part of the company's System Architect CASE tool to provide a letter or facsimile message that is then publicized throughout the company. "That praise is more real than almost anything else," said Sherma. "It's recognition not just by greedy little management saying, 'You did well for us,' but also by the people who are using the product, which is very encouraging."

Intersolv is organized to pass on praise from the field directly to the developers. Because product managers are part of the marketing organization, they have constant contact with customers and industry analysts. "But they also work daily with the development teams, so they bring developers a sense of what is going on out there in the real world," Privateer said. In addition, developers attend Intersolv's annual user conferences, where they get to meet the customers face-to-face.

Smart employers will instill a sense of pride in staff who learn to develop systems for a distributed architecture, said executive recruiter Robitaille. Change is always unsettling, and some developers are unemployed because they have shied away from the challenge and accompanying risk. Still, "it's a reasonable risk, and the next round of technology will evolve from this," he said. "People who are getting involved with it now will be extremely marketable down the road, compared to those who are stuck in the mainframe world." CIO

Mickey Williamson is a technical journalist in Warwick, Mass., who specializes in emerging technologies. She heads the Qwerty Group.

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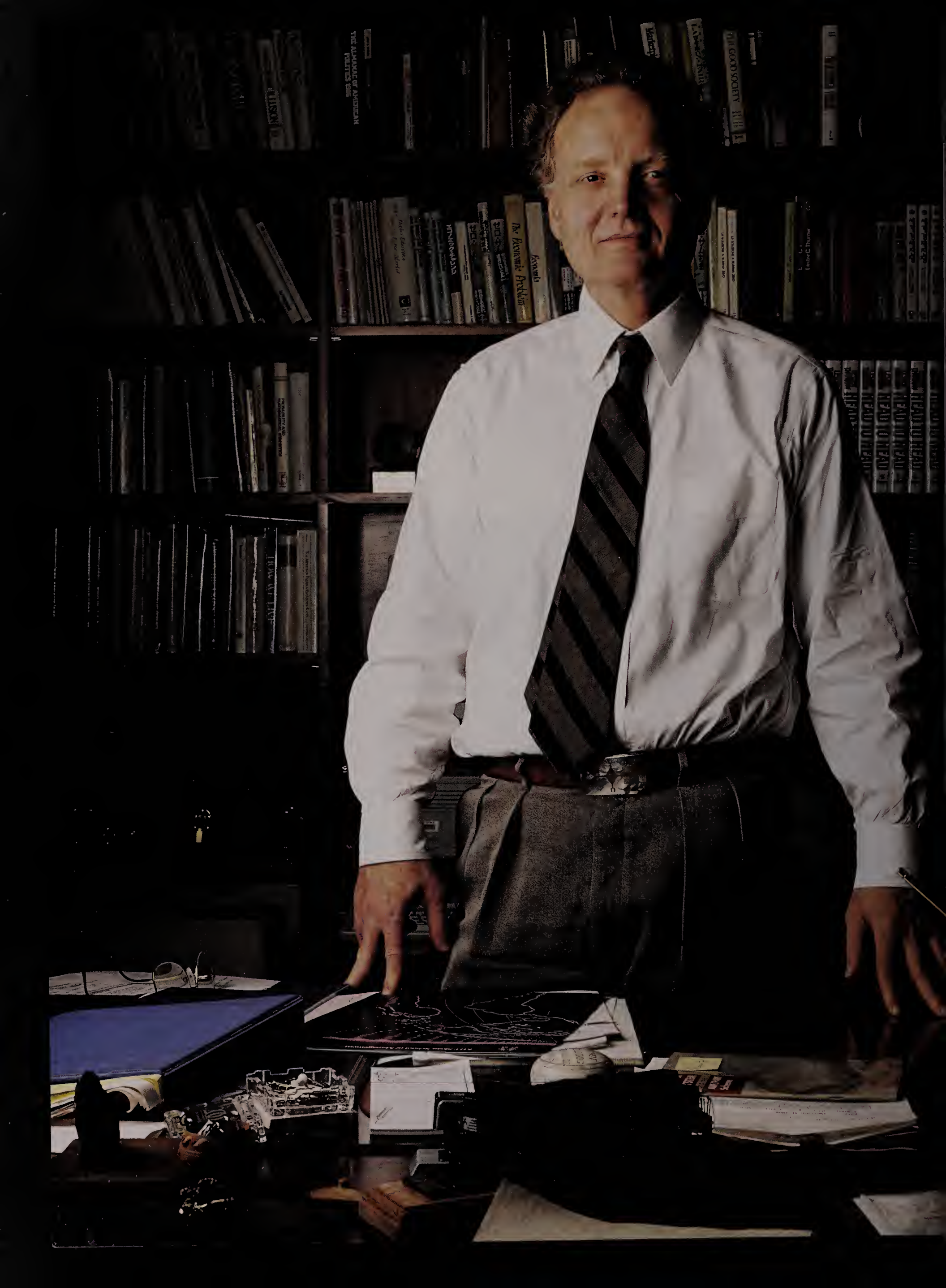

THE GOOD SOCIETY
The Economic Problem
HEADLIGHT

HEAD to HEAD

BY THOMAS KIELY

NOW THAT COMMUNISM HAS FALLEN, throw out all your old geopolitical theories. The new battle lines are geo-economic—pitting Japan, Europe and North America against each other in head-to-head competition for market share in key industries.

That is Lester Thurow's view. Dean of the Sloan School of Management at the Massachusetts Institute of Technology in Cambridge, Mass., Thurow has been an energetic proponent of a new world-economic perspective that calls for change, lots of change, in America. (Thurow will step down from the position of Dean in July but will continue to serve as professor of economics and management.)

Lester Thurow wouldn't put his money on America to win in the three-way race for global markets. But he offers some sound advice for improving our odds.

PHOTOGRAPHY BY WEBB CHAPPELL

In his most recent book, *Head to Head: The Coming Economic Battle Among Japan, Europe, and America*, Thurow notes that in the aftermath of World War II, America was the economic king in a shattered world. But in the years since, Germany and Japan regained vigor and now challenge us in global markets. All three competitors eye the same seven industries as the plums of the future: microelectronics, biotechnology, the new materials industries, civilian aviation, telecommunications, robotics and machine tools, and computers and software. These are all knowledge-based industries, Thurow points out, indicating that in the new world, technology, education and skills have replaced land and natural resources as the key assets for a competitive nation. To the winner will go the spoils: rising per capita income. The losers will feel the good life ebb away.

Thurow doesn't favor America to win. In his estimation, Europe is the better bet. America's strength lies in technology; its weaknesses include a deficient educational system and chronic underinvestment in everything from plant equipment to worker training. Japan's strength is investment, across the board; its weakness is insularity, which will hamper Japanese companies' efforts, when going global, to attract good local talent. Europe's strengths, in Thurow's estimation, are its size (if integration works, it will be the world's largest market), the complementary skills of its member nations, its educated populace and the widespread expectation among its citizens that change is both inevitable and necessary.

On a snowy winter morning, *CIO* Senior Writer Thomas Kiely visited Thurow at his MIT office to discuss American business, technology and worker training.

CIO: What do American businesses face in the near future?

THUROW: Take any product that you can think of, and go around the world and add up production, and we've probably produced 30 percent more than we're going to buy on a worldwide basis. On a worldwide basis, the growth rate was zero in 1991; 1992 was not much better, and 1993 probably won't be, either. The question is: Can you catch the turning point, when the world economy starts to pick up? The American economy seems to be picking up. The standard forecast is for 3 percent growth next year, while growth in Europe will be zero and in Japan, minus 1 percent. The problem with that is there will be a flood of imports into the United States from the rest of the world.

"In the long run, the question is: Can you use information technology to create some new industries?"

CIO: What is the role of information management in this environment?

THUROW: In the short run, you can use information technology to provide current services with fewer people. So information technology is a survival strategy, so to speak. In the long run, the question is: Can you use information technology to create some new industries?

CIO: But you've been critical of claims that technology can improve productivity.

THUROW: It's certainly true that nobody can show that technology pays off on bottom-line productivity. Not yet. Look at banking: Banks have put a lot of money into technology, and they've had lousy productivity performance. Optimists say that if you take any new technology and look at it historically, it always takes 30 years to make it pay off. Pessimists say the problem is processing all that information. We have this idea that more information is better than less. Look at accounting: We invented financial accounting, cost accounting, inventory accounting, and instead of closing the books at the end of the quarter, we do it every night. We threw a lot more information into the system, but a lot of that information clearly didn't have any kind of a payoff.

I think what we need is an algorithm to calculate when it is smart to be ignorant. Take, for instance, the product codes that are captured as they go across the supermarket counter. I worry about that. Billions of bits of information are going into some central computer somewhere, and people feel as though they've got to process that. But it may well be that those bits of information won't

give you information worth having. Will it really allow you to sell more products? When is it smart not to know?

CIO: That's a management problem.

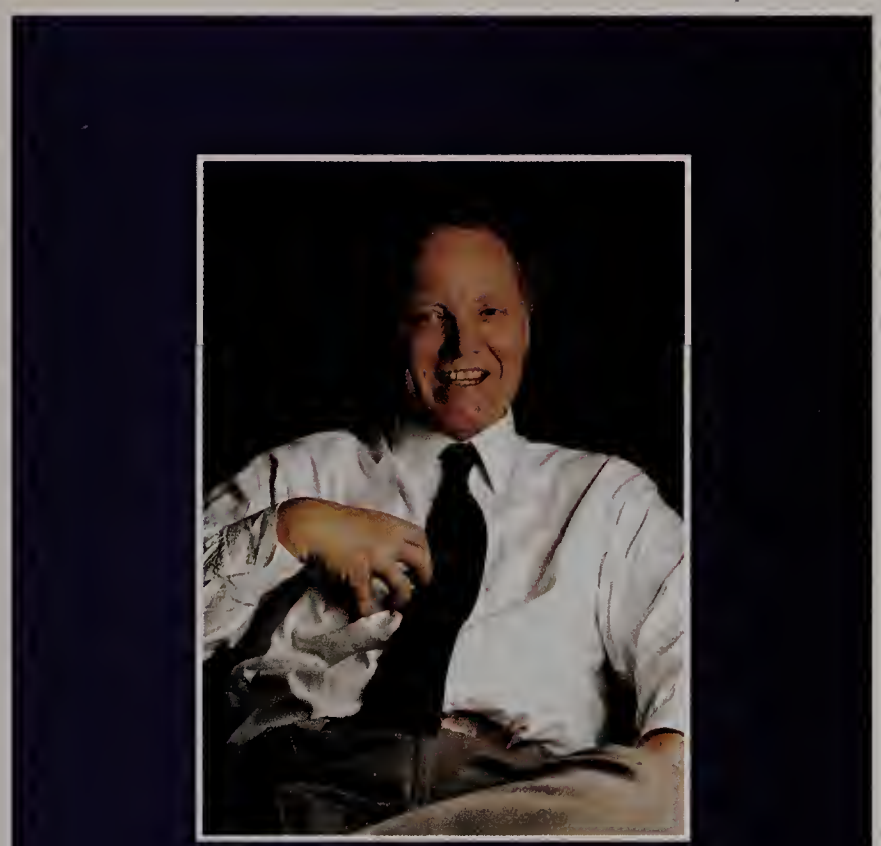
THUROW: Yes. In terms of doing the cost accounting for information technology itself, we've got a system that doesn't allow the costs and the benefits to be put together. Let's say a manager asks an underling to get number X, whatever number X might be. It may cost $100,000 to get X. The underling has no idea whether the number is worth $100,000, but the $100,000 cost goes on the underling's budget; it doesn't go on the boss's budget. Maybe the number's worth $100,000, and maybe it's not, but the way we do it in the conventional business, we'll never know. The guy who orders the number doesn't know what the cost is, and the guy who gets the number doesn't have a clue what the benefit is.

CIO: Let's look at information through another lens. The primary problem with the American economy, you say, is American education. What do you mean by that?

THUROW: The top 15 to 20 percent of the American population that goes through the universities is a workforce that's as well-educated as any in the world. On the other hand, the bottom 75 percent just isn't world-class. If you want to have a successful economy, you need a well-educated citizenry from top to bottom. The last time I visited a General Motors facility in Korea, where they make Pontiacs, there wasn't a single American manager there. There were some foreign managers in the Korean facility, but they all came from Europe. So it isn't just that the United States lost those assembly-line jobs, they lost the management jobs too. If you can't compete at the bottom, you won't compete at the top either.

CIO: What do we need to do?

THUROW: In the long run, you've got to re-skill the bottom of the American workforce. The other day I visited a German machine-tool firm. They have a Connecticut facility whose sole purpose is to take German machine tools and make them simpler so that Americans can use them. That's embarrassing. What American companies want are machine tools that basically have a green light and a red light and a button. Anything beyond that is beyond the capabilities of the workforce—not because they're dumb, but because they're uneducated and unskilled.



"I think what we need is an algorithm to calculate when it is smart to be ignorant."

CIO: How do you propose that we turn the tide?

THUROW: We need to do a four-part bargain to improve our educational system. The first part of the bargain is: If you want high-quality [teachers] in the classroom, you've got to pay them a reasonable wage—about $50,000 a year as opposed to the slightly less than $30,000 a year they now make. You have to do that, because if you look at the people now going into education, they come off the bottom 10 percent of the American college system, and do you want the stupidest people in American universities teaching in American high schools? But no one in the world gets $50,000 in wages for 180 days work. So the second part of that bargain is a world-class school year, which means 220 to 240 days.

The school system in the United States is an enormous bureaucracy. So the third part of this bargain is to trim the bureaucracy down to the levels you find in Germany or Japan, and that would give you almost enough money to pay teachers more. The fourth and most important part is that somebody's got to write a quality-control test. Elsewhere in the world, a central minister writes the test. In the United States, I think, the business community has to write it. The test should define what business expects of a world-class high-school graduate. If kids can't pass it, employers shouldn't consider them high-school graduates, regardless of what the students' school board says.

CIO: But the basics—reading, writing and arithmetic—aren't the only skills employers are demanding from employees. Workers also need decision-making skills and the ability to take initiative.

THUROW: Sure. But if you can't do the basics, forget about initiative. At the Daimler-Benz apprenticeship

program in Stuttgart, Germany, they're teaching calculus to people who didn't go to college. Fifty percent of the kids in Germany who don't go to college go into apprenticeship programs. It's interesting: If you take the people at Daimler-Benz, for instance, about 80 percent of the people who enter the program go to work for Daimler-Benz, 10 percent drop out, and 10 percent go on to universities. These are *not* dead-end programs.

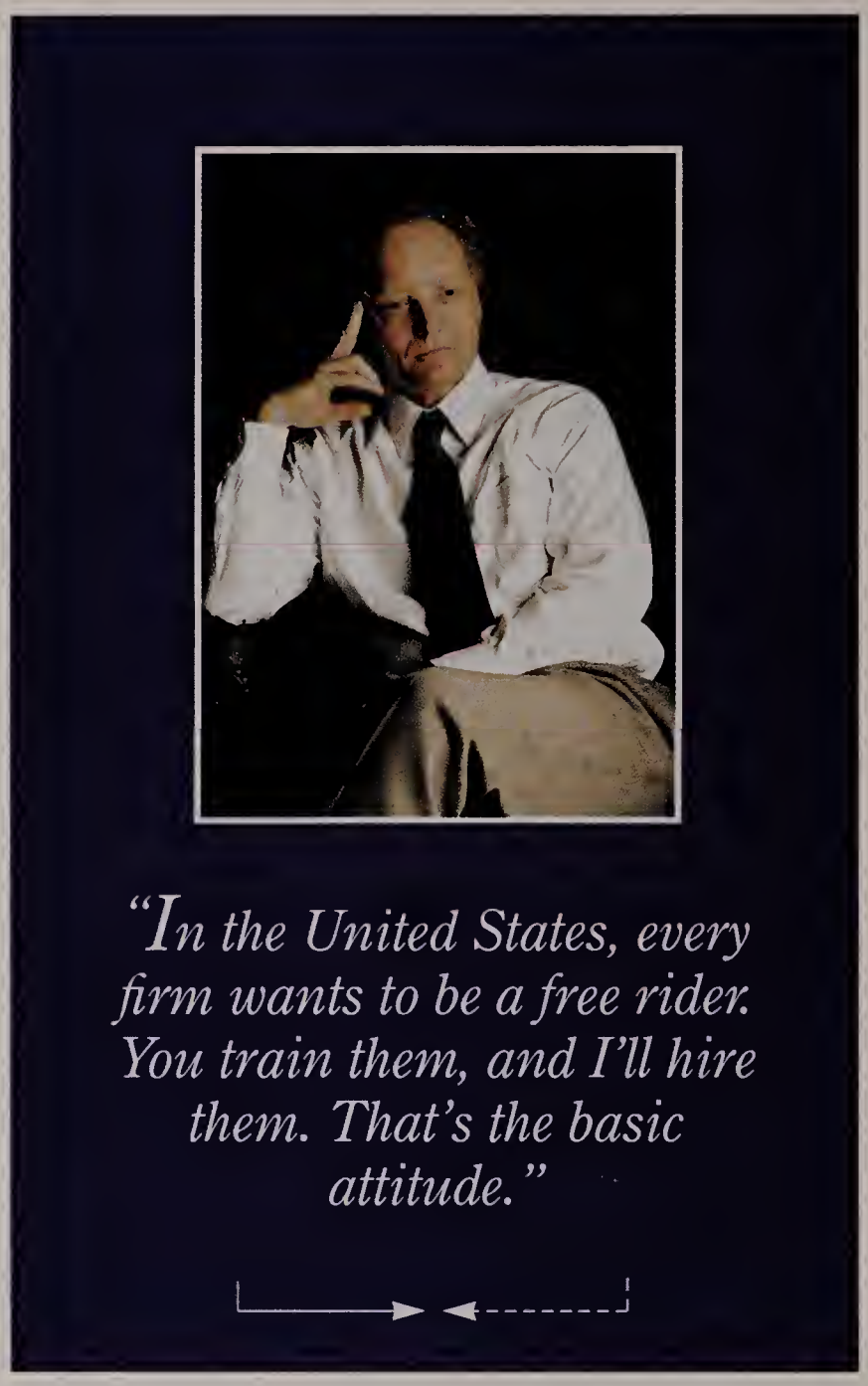
In France, every firm is required to put a certain percentage of sales revenue into a training account. If they spend it on training their workforce, they get to keep it; if they don't, the government takes it. Now the government doesn't get any taxes out of this, because of course everyone spends it. But it stops people from free-riding the training system. In the United States, every firm wants to be a free rider. You train them, and I'll hire them. That's the basic attitude.

CIO: Attitudes are tough to change.

THUROW: But Europeans understand that attitudes must change. That is one of their biggest competitive advantages. In Europe everyone understands, from a prime minister to the simplest citizen, that the twenty-first century is going to be different. Communism has gone away, and Western Europe is creating a common market. Europeans don't know exactly what the changes are that lie ahead, but they know change is going to happen. Ten years from now, people will be a little less Italian or French and a little more of a European. Europeans are talking about change, thinking about change, worrying about change. In both the United States and Japan, people think they can get by without changing. Nobody in Europe thinks you can get by without changing.

CIO: How do we begin to grapple with the concept of change?

THUROW: We really have to do systematic, international benchmarking. When it comes to economic intelligence about the rest of the world, either at the level of the nation or the business, we just don't do it. A recent study of schools in Sendai, Japan; Taipei, Taiwan; and Minneapolis-St. Paul showed that the American schools had by far the worst performance—but the parents were happier with the schools in Minneapolis than they were in either Sendai or Taipei. Why? Because the parents in Minneapolis had no concept of what a first-class performance really is. And the answer is, if you don't benchmark with the rest of the world, you may have no clue as to what a world-class performance really is.



"In the United States, every firm wants to be a free rider. You train them, and I'll hire them. That's the basic attitude."

CIO: Benchmarking is another role for information. Let's put this bluntly: Can we catch up to the Japanese?

THUROW: The Japanese aren't that far ahead. If you look at the American school system, we're not all that far behind in grade six. Where the system falls apart is in the junior high school, and that gap continues to widen through high school. But if we ask, what would it take to produce a world-quality American high-school graduate, I think it can be done in 10 years. It's as hard as the man-on-the-moon program, but no harder. After all, we improved the American education system between 1957 and 1967, in the post-Sputnik era. We know how to do it. We've done it before.

CIO: And if we don't do it? What are the implications for the average family if America can't change?

THUROW: If what is happening in the nation now continues, American wages in real terms will continue to go down about 1 percent a year. They've been doing that since 1973. Now in the 1980s, family income didn't decline even though wages declined, because women worked many more hours. Basically, working women have helped the family to keep constant. When the average American family tells you it feels pressured, it's true. They have to work more hours for the same old income. But we're getting to the point where most women are full-time workers, where the family has very little capability for raising its income by simply working more hours per week. So if the decline in wages continues, it's going to show up in the 1990s as a decline in family income. That's not a hallmark of a successful economy. CIO

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The ABCs of Executive Ed

Taking advantage of educational opportunities can enhance information executives' business acumen, bolster the status of IS in the organization and pave the way for its tighter integration into the corporate whole

BY KATHLEEN MELYMUKA

Any IS executive still stigmatized as a techie is just not paying attention. The management expertise CIOs need to become first-class citizens of the executive suite has never been more accessible. High-quality, focused business courses are plentiful, and many can be completed with minimal time spent away from the desk.

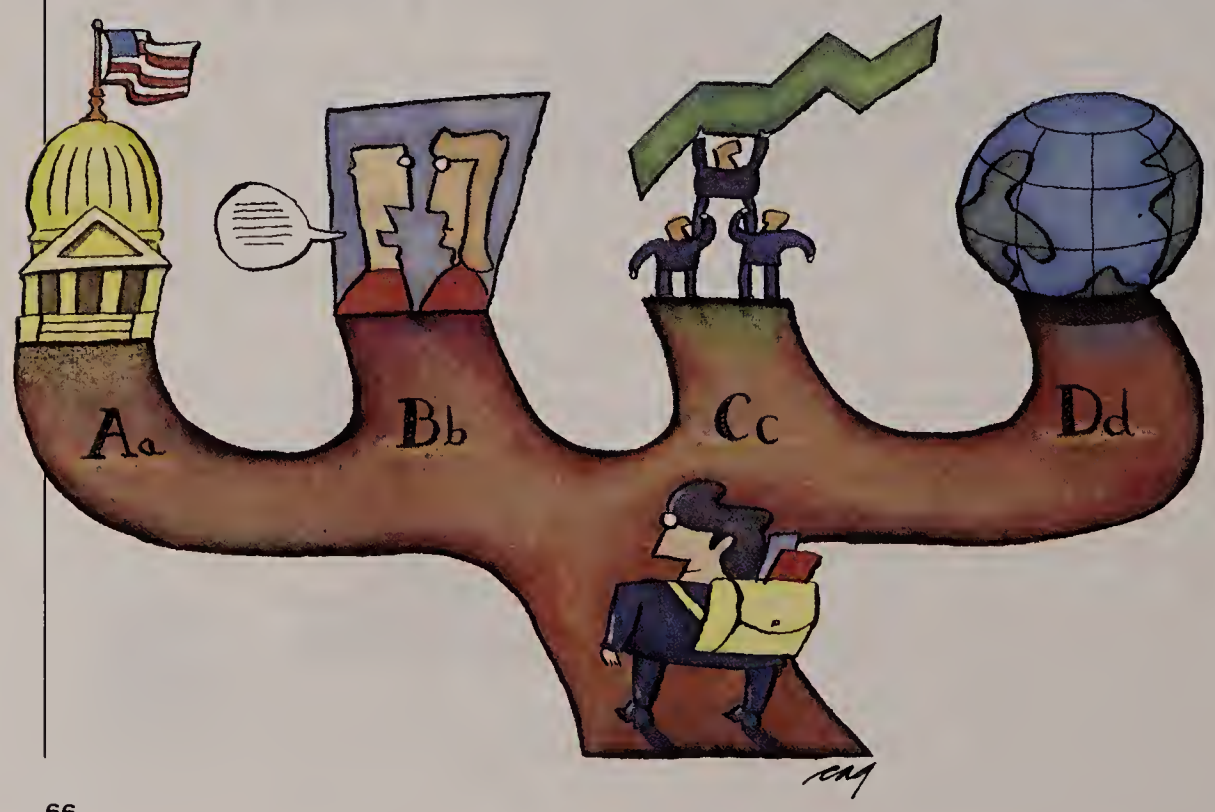
The challenge isn't finding a course; it's choosing one. "Practically every university will have a program to accommodate general management needs," explained Karen Petty, editor of *The Bricker Bulletin*, an international newsletter on executive education. "The Whartons and Harvards and MITs have excellent reputations, but a lot of regional schools also do excellent work."

Programs are evolving as quickly as the business world they serve. Their content and structure reflect diverse corporate concerns and perspectives. For example, recognizing the increasingly international character of business in the 1990s, universities are at pains to present a world view—in both course content and participant mix. The Columbia University Graduate School of Business's four-week executive program in international management helps executives develop a global perspective in formulating strategy and managing functional areas and people. The student body is international as well, often representing as many as 30 to 40 countries. This enriches the educational experience for all participants by supplementing course content with a range of multicultural ideas and perspectives.

MIT's Sloan School of Management takes a hands-on approach to global issues. Its eight-week program for senior executives includes week-long field trips to Washington for off-the-record meetings with business and government policy-makers and to a European city to meet with senior government and Common Market officials. These meetings put flesh on the bones of course content, allowing students to discuss changing economic conditions—and how they might affect their businesses—with those in positions of power. About half the students come from outside the United States.

A four-week program at the University of California at Berkeley's Walter A. Haas School of Business assesses the business impact of political and economic changes in Russia, Eastern Europe and the Middle East, as well as the increasing competitive challenge from Asia and Europe.

The International Institute for Management Development in Lausanne, Switzerland, offers a one-week program for senior executives that examines societal and environmental pressures on business, such as the need to integrate corporate policies and practices with environmental concerns. The program also explores changing corporate roles, sustaining



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competitiveness while meeting society's expectations, organizational models most likely to survive and integrating new dimensions into staff thinking.

The well-rounded IS executive needs to look inward, as well, and develop an interfunctional perspective of his or her organization. A program at the University of Michigan School of Business Administration examines critical core business issues from a multidisciplinary perspective. Faculty from finance, corporate strategy, organizational behavior and psychology, human resources, and computer and information systems provide equal time for each viewpoint.

A two-week program at the University of Pennsylvania's Aresty Institute of Executive Education at the Wharton School helps functional managers make the transition to general management. Enrollees manage hypothetical businesses and work in cross-functional teams with the help of computer simulation (this is discussed in greater detail below). A leadership-practices survey, to be completed by participants and their business superiors, peers and subordinates, enables the students to understand their own leadership patterns and change them if necessary.

Many courses zero in on the specific needs of CIOs. Harvard University's Graduate School of Business Administration offers a one-week exploration of relationships among general, IS and human-resources management. On a more nuts-and-bolts level, Harvard also offers a two-week course that focuses on managing, evaluating and planning the development of information systems in the organization. Participants learn to integrate the IS plan with corporate strategy and use IT as a competitive weapon; and they explore the role of IS as a change agent.

The John E. Anderson Graduate School of Management at the University of California at Los Angeles has a one-week program to help mid-level and senior IS managers learn to better position IT within the organization. Content includes creative thinking and problem-solving, leadership, management styles, people and team management and managing the technical function.

The role of information systems in global business and how technology can be exploited to achieve maximum competitive advantage is the focus of a one-week course at the London Business School.

Recognizing the increasingly international character of business in the 1990s, universities are at pains to present a world view—in both course content and participant mix.

Some programs cater to specialized audiences. Smith College's management program concentrates on analytical and behavioral skills for women moving into management positions and women with technical backgrounds. Participants carry out a clinical project in their workplaces over one academic year and attend two three-week seminars—one before the project and one after it. The curriculum emphasizes teamwork, globalization, managing diversity and communication.

The University of Pittsburgh's Joseph M. Katz Graduate School of Business offers a one-week seminar dealing with the specific problems and opportunities of expanding companies. Targeting senior managers in organizations with 20 to 500 employees, it aims to develop managers' ability to capitalize on expansion opportunities and improve competitiveness. Duke University's Fuqua School of Business offers a similar program for senior executives in mid-sized companies.

Anyone whose management training predates the mid-1980s might want to brush up their skills. The Amos Tuck School of Business Administration at Dartmouth College is running a program in two one-week units to explore themes that are critical today but were not part of MBA curricula 10 years ago. (The program is open to senior executives with either an MBA or equivalent job experience.) Content includes managing across borders, cross-cultural communication, team management, high-performance cultures, diversity in the workplace and the quality revolution.

Case studies are a primary teaching tool in virtually all these programs, with many simulating cases on computer. At Wharton's Aresty Institute, about half the courses use computer simulation. The course for functional managers making the transition to general management, for example, uses Strategic Leadership Simulation, a custom simulation program from the Strategic Management Group in Philadelphia, to create a business universe within which students learn to manage and focus information from dispersed functional areas.

The class is broken into teams representing competing corporations, and each team is divided into groups representing functional areas within the corporation. Each functional-area group is placed in a separate room and allowed to communicate with the rest of the team only via networked 486 PCs (DEC 433STSs, plus some IBM PS/2 model 80s) and telephones. The computer models the company's progress based on the decisions team members make. It also provides access to critical information such as financial data and market reports derived from the decisions and actions of the various teams. Team members must share this information as appropriate across functional lines and focus on overall strategies to beat competing companies.

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tis L. Carlson School of Management takes case studies a step further. Participants in its executive program and its management institute work with both textbook and "live" cases, analyzing real corporations and acting as consultants on business policy and direction to the president and company officers.

Other trends in include outdoor, Outward Bound-type leadership and teamwork exercises that emphasize fitness, wellness, nutrition and stress-reduction.

Just as program content has changed to reflect new business concerns, so has the amount of time the programs require. Harvard's Graduate School of Business Administration Advanced Management Program—inaugurated in the 1940s and the model for much that has come after—is an 11-week course. For many executives, 11 weeks away from the workplace is unthinkable. As a result, universities are condensing courses and offering scheduling options. "They're doing what they teach their students to do: meet customer needs," said *Bricker*'s Petty.

While some courses at Duke's Fuqua School are delivered in one solid block of time, others are offered in multiple blocks of lesser duration (two sessions of two weeks or four of one, for example—the differing schedules are not elective but rather tied to particular courses). Participants in the advanced management program at the University of Southern California School of Business Administration attend five two-day sessions, scheduled on Fridays and Saturdays over a four-month period, so the executive is out of the office as little as possible. UCLA's Anderson School metes out its certificate-granting executive program in 33 single days over nine months (about one five-hour session per week).

Perhaps the ultimate response to executives' scheduling needs, however, is "distance learning," which enables students to take courses without leaving their home turf. The Wharton School, in cooperation with the National Technological University, offers a series of live, quarterly, 90-minute videoconferences via satellite. Recent topics have included the nature of the current recession and the dynamics of recovery, and the effect that the aging of baby boomers is having on savings, stock markets and interest rates. Presentations in-

Perhaps the ultimate response to executives' scheduling needs is "distance learning," which enables students to take courses without leaving their home turf.

corporate segments developed using PS/2 model 80s with Harvard Graphics for Windows. They are also interactive, with participants able to ask and receive answers to questions. To take part, corporations must have access to an interactive satellite network.

In the vanguard of distance learning is the International School of Information Management in Santa Barbara, Calif., which provides accredited programs for master of science degrees (in information-resources management) by computer and modem. Beginning later this year, ISIM will offer an MBA program with an IRM focus and certificate programs in telecommunications and computer technology. The courses are conducted via a computer-conferencing network that provides a Windows-like interface for interactive exchanges between faculty and students. (ISIM provides the communications software.) Courses are self-paced, with the network available 24 hours a day, and students can "talk" with other students as well as the teacher through public or private E-mail boxes.

Many universities offer to tailor programs to a company's needs. The Fuqua School, a leader in custom programs, designs courses for Johnson & Johnson, Eli Lilly & Co., Bethlehem Steel and Ford Motor Co., among others. The courses are generally designed around one of three models: a general-management program adapted to a specific company, a program that concentrates on a functional area or a program built around the Fuqua faculty's diagnostic assessment of a company's needs.

The Wharton School combines distance learning and custom programs to offer live videoconferences for particular audiences. For example, an executive who has attended a course at Wharton might ask for a series of custom video seminars on basically the same subject as the course (sales, for instance) but tailored to the specific circumstances of his or her corporation. ISIM offers customized courses over its network.

Petty pointed out that there is a hidden cost to custom programs, however. "You can tackle your own issues," she noted, "[but] you lose interaction with your peers in other companies and industries."

Speaking of costs, they vary. None of the programs is exactly cheap. On the high end, the Sloan School's eight-week course for senior executives will set you back $31,900. At $9,400, the 33-day executive program at UCLA's Anderson Graduate School has a per-day cost of about half that.

For more information, *Bricker's International Directory*, published annually by Peterson's Guides in Princeton, N.J., provides a comprehensive listing of more than 600 executive-education programs. In addition to course descriptions, the directory provides such information as the average age, management level and salary of participants. Whether you need a general-management course or a highly focused educational supplement, a look at the variety of offerings will convince any CIO that it's never been easier to escape the technology ghetto. CIO

Kathleen Melymuka is a freelance writer based in Duxbury, Mass.

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FRONTLINE

BY PORTIA ISAACSON

Why should management visualization concern IS executives? Because they are managers. Because visualization technology is challenging and needs leadership and support. And because visualization tools are the most fundamentally important information technology since the typewriter.

PHOTO BY WEBB CHAPPELL

The Vision Thing

PICTURE THAT!

Today, in the final stage of the Information Age, we are well into the Era of Visualization. By "visualization" I mean the act of imagining—of seeing an image in the mind's eye—then giving form to that image using computer-based tools. The form might be a mathematically specified movie modeling the life of an electromagnetic solitron, or a simple line drawing that expresses a business strategy clearly and intuitively. A better term for this might be "computer-aided visualization" or "CAV"; however, I prefer to use the term "visualization" so that our intuition is guided toward the creative aspects of this process rather than the computer tools that give it form.

Visualizations are metaphorical tools—models that give unique insight into the idea or theory being visualized.

The beauty of a visualization—the computer-based externalization of the imagination—is that other people can see and work with an idea in its image-metaphor form. Visualizations can even become the brilliant and guiding representations of the group (or corporate) imagination. Imagination is the prerequisite for creation, whether we are designing a new car, refurbishing an old company or setting goals for a career. Visualizations that depict a company's dreams and goals are called "visions," and the leaders who communicate them well are known as visionaries.

Visualizations are not just decorative diagrams or entertaining movies of simulated natural phenomena. Rather, they are metaphorical tools—models that give unique insight into the idea or theory being visualized. In his extraordinary book, *Breaking the Mind Barrier: The Artscience of Neurocosmology*, Todd Siler called these metaphorical tools "metaphorms—an object, image, concept, or process that we compare to something else." For example, when we describe (or draw) the mainframe as a dinosaur, we present an idea that is profoundly different from when we describe it as an information warehouse. Both are simple images, but they evoke vividly different ideas.

The Boston Consulting Group's portfolio-evaluation model, named the Growth-Share Matrix, is a well-known visualization tool so powerfully intuitive that it is used in investment and divestiture decisions. In the Growth-Share Matrix, the growth rate of a market in which a business unit participates is plotted along the vertical axis of a four-square matrix, and the relative share of the business unit in its market is plotted along the horizontal axis. The quadrants are labeled Stars, Question Marks, Cash Cows and Dogs.

Even computer programming is going visual. New graphical programming tools are enough to make a CIO want to write (make that draw) a little code.

In his book, *Charting the Corporate Mind: Graphic Solutions to Business Conflicts*, Charles Hampden-Turner suggests replacing the Growth-Share Matrix decision-tree with his own approach to reconciling dilemmas—another visual metaphor for management analysis. And for a wealth of visual metaphors worthy of the Contemporary Museum of Management Artscience, see Kenichi Ohmae's *The Mind of the Strategist*.

Seeing Is Achieving

THE PICTURE-LESS PROFESSION?

As we look across diverse fields of human endeavor, we find that visualization is becoming intimately intertwined with most forms of enterprise. For example, molecular-structure visualizations that sometimes require supercomputers have forever changed the way chemists do chemistry; visual simulations have become an equal partner of theory formulation and laboratory verification. Electrical engineers can't engineer without ORCAD, and architects are helpless without AutoCAD. And with consumers flocking to Tandy's Incredible Universe superstores to experience virtual reality, *Star Trek*'s holodeck—a holographic visualization of epic proportions—seems just around the century.

Even computer programming is going visual. New graphical programming tools, such as Microsoft's Visual Basic, are enough to make a CIO want to write (make that draw) a little code. (Even I succumbed on a cross-country flight last year when—without the Visual Basic manual—I succeeded in drawing Power Trip, a visual game for CIOs.) End users are adopting graphical (that is, visual) user interfaces, such as Macintosh and Microsoft Windows, faster than any new technology in the history of computing. Why? Because vision is the human's highest bandwidth input from today's external electronic media—and because the linearity of text can make you crazy. As any

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programmer knows, the adage, "a picture is worth a thousand words," seriously understates the information in an image.

A more important reason for facilitating management visualization is that thinking in visual metaphors is a right-brain, intuitive activity. In *Maps of the Mind*, Hampden-Turner calls right-brain thinking "timeless, diffuse, holistic, visuo-spatial, intuitive and simultaneous. Its aim is to synthesize new whole patternings as it scans intuitively over patterns and pieces searching for a simultaneous fit." Now that it is in vogue, intuitive management needs its own tools, just like its partner, rational management. The spreadsheets of intuition are visual metaphors—metaphors that are closer to Boston Consulting Group's Growth-Share Matrix than to bar graphs or pie charts, which are only bridges between rational analysis and intuition.

In spite of the fact that business is today's most creative human endeavor, management is the last stronghold of linearity. Admittedly, we are making some inroads with EIS for senior executives. But what about vision for the rest of us?

We have the shovels and hoes in desktop publishing, now so commonplace that we hardly notice it, and in graphics, the third most frequently used type of program on PCs. But where is the mean machine of management vision? Where is the ORCAD of business

with the built-in library of management visual metaphors? Where is the software that helps organize large hypernets of visually expressed ideas, each with attached text and perhaps voice explanation? Am I describing the coming generation of document-management systems? I haven't seen it. The question remains: From whence will the artscience of management spring?

If I were a CIO, I would create a book called *How My Company Works*, based on workflow analysis, with drawings so wonderfully simple yet information-rich that they would be the darlings of the boardroom.

Why should management visualization concern CIOs? Can't the graphics-design department handle this opportunity? No. Graphics artists have a place in more-specialized graphics productions, but everyday business graphics should be created under the eyes (if not the fingers) of the person using them.

The CIO should be concerned about management visualization because: (1) he or she is a manager; (2) visualization technology is challenging and needs leadership and support; and (3) visualization tools are the most fundamentally important information technology since the typewriter. The information executive also has the opportunity to create a Corporate Visaurus (see definition below), since he or she is probably leading the re-architecting of the corporation.

If I were an information executive, I would create a book called *How My Company Works*, based on workflow analysis, with drawings so wonderfully simple yet information-rich that they would be the darlings of the boardroom—and the framework for intuitive decision-making.

The next big step in PC graphics machines will be color pen computers (soon) with a management-visualization assistant.

Vision Technology

THE REALITY AND THE DREAM

Graphics is becoming commonplace so rapidly that we could think of all computing as visualization technology. However, the development and price/performance improvement of technology specifically for visualization is proceeding much faster than computing in general. High-performance supercomputers (e.g., Cray) and workstations (e.g., Sun) are behind some of the most performance-hungry motion visualizations and resource-demanding CAD applications. But everyday PCs are also becoming visualization-capable. Even 386-based PCs, and certainly 486s, with local-bus video (e.g., NCR Microelectronics VGA) are mind-expanding graphics machines at a Wal-Mart price. Vision's time has come.

Anyone looking at PC graphics today should keep in mind that graphics under Microsoft's Windows is not quite ready for prime time, while Macintosh is a management-visualization dream. For making presentations from a notebook computer, it's hard to beat the Toshiba T4400SXC, which connects to a VGA projector while still allowing the presenter to view the color LCD display (would that my PowerBook 170 had such features). The next big step in PC graphics machines

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will be color pen computers (soon) with a management-visualization assistant.

I dream of two tools needed for management visualization. One is a reference book with an online version. The other is a "vision" processor—in the sense of "word" processor.

For years I have dreamed of a management "visaurus"—a hefty reference book filled with sample drawings of business ideas. It would be organized just like a thesaurus: Look up "competitors," for example, and you'd find maps of competitive companies that could be applied to your organization (e.g., the Growth-Share Matrix). Each drawing would be selected for its power as a visual metaphorical tool and its potential application to many different businesses. The online version would feature templates for applying the metaphorms to specific situations, as well as template text for captioning. The management visaurus would be the dictionary for the artscience of management. I have been collecting examples for a management visaurus for 15 years, and if the IT business ever gets boring, I'll publish it.

A vision processor would support image-centered writing that facilitates the association of text with a drawing or sequence of drawings. Whenever a particular drawing is placed in a document, its explanatory text would also be available for placement.

My other dream is of a vision processor. Today's presentation-graphics packages (e.g., Aldus Persuasion) with page-layout programs (e.g., Aldus PageMaker) are a good start, but they are only a start. For a visual-thinking person (like me), a graphics package that lets me make one drawing at a time and then forces me to manually associate text with that drawing in a page-layout program is as useless as a word processor that allows me to write only one paragraph at a time. Imagine having to manually string together paragraphs to create a document—that's what most presentation graphics require (Aldus Persuasion's outline-view feature being a step up). A vision processor would support image-centered writing that facilitates the association of text with a drawing or sequence of drawings. Whenever a particular drawing is placed in a document, its explanatory text would also be available for placement. Vision-processor users wouldn't have to know about linking, embedding or other vision-repressing magic. A vision processor would permit naming each drawing with its text for retrieval during a presentation or use in a document. Drawings would be hyperlinked to each other so that related drawings could be easily remembered and accessed. A vision-processing system with a few layers of intelligence would grow up to be a visualizer—a general-purpose idea-processing, creation-specifying tool so qualitatively different from a computer that it should have a new and inspiring name.

Until Nikola Tesla's famous dream—of capturing on film the images in the mind's eye—becomes a reality, I will be happy with a management visaurus and a vision-processing package—unless you can get me a visualizer at 30 percent off.

New-Age Tools

THE BIRTH OF IDEA-ENGINEERING

In the book, *Strategy for Creation*, T. Murakami and T. Nishiwaki of Tokyo's Nomura Research Institute (NRI) make a strong case that the next age of enterprise in the Agricultural Age, Industrial Age, Information Age sequence will be the Creation Age. According to NRI, the "conceptor" will be the primary tool of the Creation Age, just as the computer has been the primary tool of the Information Age. The conceptor will empower our creative, intuitive side to perform idea generation and management, integrating these faculties with our cherished logical, analytical tools. The conceptor will enable us to create a discipline of idea-engineering that empowers human creativity. I recommend *Strategy for Creation* for its content and because it is a study in visual-metaphor usage.

You've probably guessed that instead of the conceptor envisioned by NRI, my candidate for the primary tool of the Creation Age is the visualizer—the tool that we will develop during this Era of Visualization, the final stage of the Information Age. Each new age is launched when the tools developed in the preceding era (e.g. machines in the Industrial Age) are extended in some wonderfully unexpected and creative way to become the tools of the next (computing machines in the Information Age). These tools so dramatically change the ways of creating value that all enterprise is transformed. Soon the visualizer will be ready to meet its destiny, and visualization will become the foundation for business planning, intuitive analysis, bilateral decision-making and the creation of value. Who knows, CIO might someday stand for "chief idea officer." Picture that! CIO

Portia Isaacson is president of Dream IT Inc., headquartered in Colorado Springs, Colo., a consultancy, publisher and workshop producer dedicated to providing quality information to customers and creators of frontline IT.

Additional Reading

Breaking the Mind Barrier: The Artscience of Neurocosmology
by Todd Siler, Simon and Schuster, New York, 1990

Charting the Corporate Mind: Graphic Solutions to Business Conflicts
by Charles Hampden-Turner, The Free Press, New York, 1990

Maps of the Mind: Charts and Concepts of the Mind and Its Labyrinths
by Charles Hampden-Turner, Collier Books, New York, 1982

The Mind of the Strategist: The Art of Japanese Business
by Kenichi Ohmae, McGraw-Hill, New York, 1982

Strategy for Creation
by T. Murakami and T. Nishiwaki, Woodhead Publishing, New York, 1991

THE COMPUTER BOWL IS FILLING UP.

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The Computer Museum's 1993 Computer Bowl Presented By: The Association for Computing Machinery (ACM); Date: May 14, 1993; Place: The San Jose Convention and Cultural Facilities, San Jose, California; Satellite broadcast to: The Computer Museum, Boston, Massachusetts.

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The Computer Bowl

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Workflow Brings 50% Productivity Improvements

by Scott C. McCready

Business magazines are glutted with articles concerning quality, U.S. competitiveness, and the inevitable references to re-engineering, rightsizing, and smartsizing. Individually, these subjects are interesting. Collectively, they suggest that significant change in the 1990s is the mandate for U.S. business. No longer can companies afford business as usual. Instead, the unusual will become commonplace.

As companies sift through the numerous ideas concerning future business directions, many are questioning whether previous investments in information technology (IT) really paid off. At the same time, major suppliers of technology such as IBM, Digital, and NCR are examining their approaches to business.

Fundamentally, U.S. business has reached an historical juncture. Users of IT are no longer content to simply cut costs or use IT as a means to reduce staff. Instead, IT is increasingly being used as a way to improve upon the hire and fire strategies of yesteryear. From an IT supplier perspective, hardware margins have suffered to the point where IBM, Digital et. al. can no longer afford to provide their traditional customer support and maintenance offerings.

IT spending must shift away from transaction processing towards automating people, and more importantly, the relationships that exist between people. The good news about going in this direction is that corporations can place many of their existing and new business processes under programmatic control. This will be made possible by the broad-based implementation of new workflow techniques and technologies, some of which have already delivered fifty percent productivity improvements at companies such as American Express, Connecticut Mutual Life Insurance, Aetna, and TRW.

The ultimate challenge for senior management in the 1990s is to have a business model for future automation efforts that both users of IT and suppliers can share. Unless users and suppliers share a common vision of the future, IT expenditures will fail to return the investment that U.S. industry needs to remain competitive.

IDC/Avante has developed a business model for corporate managers which can help them articulate how various types of technology can automate their many different business processes. Several major system suppliers have already adopted the IDC/Avante view of the world.

In this new age of openness and change, a common vision is available. We are anxious to share with you how your organization can obtain the productivity improvements available from workflow, and how workflow is the keystone to business process automation.

McCready is a principal at IDC/Avante Technology, a market research firm in Framingham, Mass. The company recently completed a 1200 page report on workflow software entitled, "Workflow Software: The Challenge for the '90s."

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Fast Access, Fast Relief

With more than 300,000 documents in its corporate library, prescription-drug company Parke-Davis needed a way to get information quickly and easily into the hands of staff working with regulatory agencies. Object-based document retrieval was it.

In the pharmaceuticals industry, time to market for new products is measured in years. Companies typically spend several of them—as well as millions of dollars—on research and development. Before hitting the market, products must be approved by regulatory agencies, sometimes from around the world. All in all, the process takes an average of 12 years and costs in excess of $200 million. Any delays can translate into lost revenues.

Parke-Davis, the prescription-drug division of the Warner-Lambert Co., based in Morris Plains, N.J., uses a document-retrieval system to access new-product information. Because questions posed by regulatory agencies can be answered in minutes rather than days, Parke-Davis gets its products to market faster. According to Rosemary Sparacio, product labeling manager, Parke-Davis catalogs everything written about its products and the products of its competitors. The corporate library contains more than 300,000 medical articles, research and clinical-trial reports and memos. In 1990, Sparacio helped provide marketing executives and medical staff with the documents they needed to respond to regulatory agencies during each new product's approval process.

"Manually searching all of our files was becoming difficult to manage efficiently," said Sparacio. "And the number [of documents] was increasing every day." With limited knowledge of retrieval technology, Sparacio turned to Warren Schaub, manager of the office information systems group.

Working with Sparacio's group, Schaub identified three requirements of a document-retrieval system: It had to be easy to use; compatible with WordPerfect, and able to run in a distributed environment so that new users could be added cost-effectively. After several product demos, Schaub selected the TOPIC document-analysis and -retrieval system from Verity Inc. of Mountain View, Calif.

Since 1990, when TOPIC was first installed, the system has grown to include 1,800 documents on four Parke-Davis products. Information is either scanned or input electronically via E-mail or disk into a centralized DEC VAX. A network of IBM PS/2s is used to conduct search requests and access the information.

Users build a knowledge base of retrieval objects or "topics"; these enable the system to search for and retrieve documents that contain relevant information on a specified subject. For example, if a marketing manager has questions regarding the use of a particular drug among a certain age group of women, a modular search can be constructed using all of the requested characteristics. Once created, topics can be reused when similar searches are requested.

TOPIC's use has expanded beyond new-product information to include product labels. For every product, there is at least one label for each country in which it is marketed, as well as a core product label from headquarters. The labels include such information as warnings, indications and possible side effects. TOPIC helps Parke-Davis recognize inconsistencies and respond on its own. "It's better for a label change to come from the company rather than a regulatory agency," Sparacio said. This could lead to cost savings, she added, because a regulatory agency has the authority to halt the sale of a product until inconsistencies are eliminated.

–Megan Santosus

VITAL STATISTICS

Organization: *Parke-Davis division of the Warner-Lambert Co., Morris Plains, N.J.*

Application: *Document-retrieval system*

Technologies: *A distributed network of IBM PS/2s installed with TOPIC document-retrieval software from Verity Inc. and DEC Pathworks E-mail, and integrated with a DEC VAX/VMS*

Scope: *Marketing executives and physicians in the medical and scientific affairs department*

Sponsor: *Warren Schaub, manager of the office information systems group*

Objective: *To respond quickly to questions from regulatory agencies during the drug-approval process*

Payoff: *Improved employee productivity from their being able to easily locate and access specific information needed; improved time to market of new drugs; fewer instances of sales halted by regulatory agencies due to inconsistencies in labeling*

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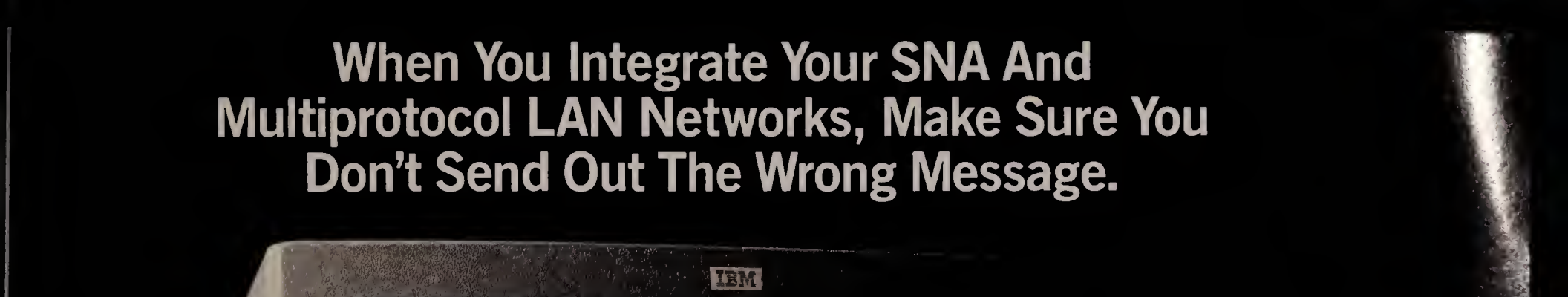

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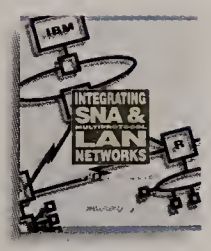

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